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COMPUTERWORLD

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DEC asserts price control

Shuffle hikes system prices; memory, disk cuts target add-on competition

BY NINAMARY BUBA MAGINNIS
CW STAFF

MARLBORO, Mass. — In a major price shuffle, Digital Equipment Corp. last week boosted prices of its high-end VAX computers and low-end VMS software while slashing memory and mass-storage prices by more than 50% in some cases.

DEC's announcements appeared to be the company's response to market incursions by third-party memory and storage vendors. The moves could spark a price war among DEC and those vendors, some of which said they may respond to DEC's moves.

DEC apparently sought to raise prices on products such as CPUs and operating systems, with which it has no third-party competition, while cutting prices in areas such as memory and storage, in which users traditionally seek lower non-DEC prices.

DEC is "rebalancing" prices of its components and VAX systems, said Harvey L. Weiss, vice-president of U.S. operations. "The prices of some of our layered software and some of our processors are being increased to reflect their market value," Weiss said.

Discount structure

Along with replacements of its VAX 8200, 8300 and 8500 models (see story page 6), DEC also announced a discount structure that applies to both end users and OEMs. The simplified schedule is based on dollar volume alone, with any customer qualifying when more than $500,000 worth of products are purchased, a DEC OEM said.

Although some system prices increased significantly, Weiss said the new discount structure, VAX price/performance improvements, the across-the-board one-year hardware warranty and lower prices for add-on memory and disks would "pro-

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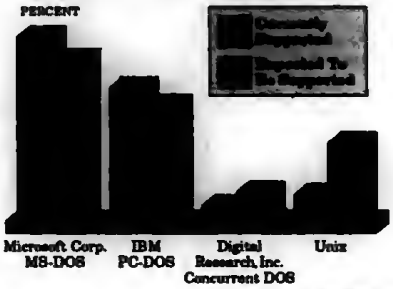
Unix challenges MS-DOS

Unix paces changes in corporate micro use. Story page 8



CW CHART: MITCHELL J. HAYES

IBM gives Windows subtle nod

BY JEAN S. BOZMAN
CW STAFF

CHICAGO — An IBM independent business unit last week declared its support for Microsoft Corp.'s Windows operating environment as the basis for a future line of desktop publishing products, marking the strongest IBM endorsement yet for Windows.

At the same time, IBM gave its official stamp of approval to Postscript, the page-description language interpreter from Adobe Systems, Inc., which is increasingly gaining momentum as an industry standard.

However, IBM provided few details on forthcoming products and said it does not plan to announce them until later this year. IBM also would not comment on the extent of its commitment to Windows other than to term the environment a "standard."

"We have chosen three standards [for publishing systems], and they are IBM PC-DOS, Microsoft Windows and Adobe

Continued on page 10

Paradyne penalty set

BY JAMES A. MARTIN
CW STAFF

LARGO, Fla. — Ending a four-year controversy, Paradyne Corp. reached an $8 million settlement last week with the Department of Justice regarding a 1985 indictment accusing Paradyne of fraud in a government systems bid.

The settlement dismisses all charges against Paradyne except conspiracy, to which the company pleaded guilty and for

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MODEL DATA CENTER

The house that MIS built

BY GLENN RIFKIN
CW STAFF

For Jack Owens, the past five years were a disaster waiting to happen. The potential maelstrom was Shearson Lehman Brothers, Inc.'s antiquated data center, an overburdened facility squeezed into 4,000 square feet within one of Shearson's Wall Street sites in Manhattan.

A burgeoning financial services business had forced Shearson to implement six expansions of its data center in seven years to accommodate an explosion of equipment — 35,000 square feet worth — jammed into various parts of the building. "We had so much channel cable that we couldn't get the floor back down anymore," says Owens, Shearson's senior vice-president in charge of information systems. "We had violated so many clearance guidelines squeezing our computers into the space that when we called IBM for service, we told them to send only thin service people.

Shearson's Owens

"There wasn't any emergency power in the building, we didn't have adequate truck docks or freight elevators, and the building wasn't fully sprinkled in case of fire. And there was a greasy-spoon restaurant and a pizza shop in the lobby of the building. Nobody slept very well."

For Owens and Shearson, the nightmare ended in November, when the data center and its 1,250 employees moved into new $200 million quarters north of Wall Street on the border of Soho. With a blank slate and strong upper management support, Owens and his team of engineers constructed a state-of-the-art building

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NEWSPAPER

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MCI: Deregulate AT&T

Exec urges FCC to focus on Bell companies

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — Blasting away at the Federal Communications Commission, MCI Communications Corp. last week called for total deregulation of AT&T and more regulatory oversight of the divested Bell operating companies.

Separately, AT&T formally proposed on Friday that the FCC "streamline" regulation of the long-distance telecommunications market.

AT&T asked that tariffs be enacted 14 days after filing and that opponents bear the burden of proving that proposed tariffs are unreasonable.

"The FCC has its priorities backwards," said MCI President Bert C. Roberts Jr., "devoting substantial resources to micromanaging the emerging competition in the long-distance industry while advocating that the monopoly providers of local telephone service be unleashed into other industry segments."

In particular, Roberts said MCI is seeking an end to the FCC's policy of setting AT&T's rate of return, which largely determines AT&T's customer rates.

The FCC policy has triggered a series of price cuts by AT&T that has in turn caused MCI to cut prices at the expense of its profit margins.

Deregulation would give AT&T more pricing flexibility, but MCI is betting that AT&T will show more price stability if it is not forced by the FCC to cut rates every time local-access costs are reduced.

Roberts said he was less concerned with the FCC-inspired rate cuts than with the evidence that the divested Bell operating companies have excessive profits and have sharply raised their rates for access to the local loop.

MCI made its recommendations in a filing to the FCC as part of a regulatory proceeding that proposes service-by-service deregulation of AT&T [CW, Dec. 22, 1986].

Roberts said the FCC should stop its piecemeal approach to deregulating AT&T, which he said is creating an "artificial market environment."

Operations seen to offer expanded career paths

BY DAVID A. LUDLUM
CW STAFF

NEW ORLEANS — The rapid evolution of computer technology is radically changing the operations department, requiring managers and staffs with both greater technical acumen and better people skills, according to operations managers.

The evolution of the data center from a production-oriented facility to an on-line, service-oriented one is opening career paths in programming, operations analysis, network management and data-center help desks, according to many at the Association for Computer Operations Managers' seventh annual conference, which drew a record 700 attendees.

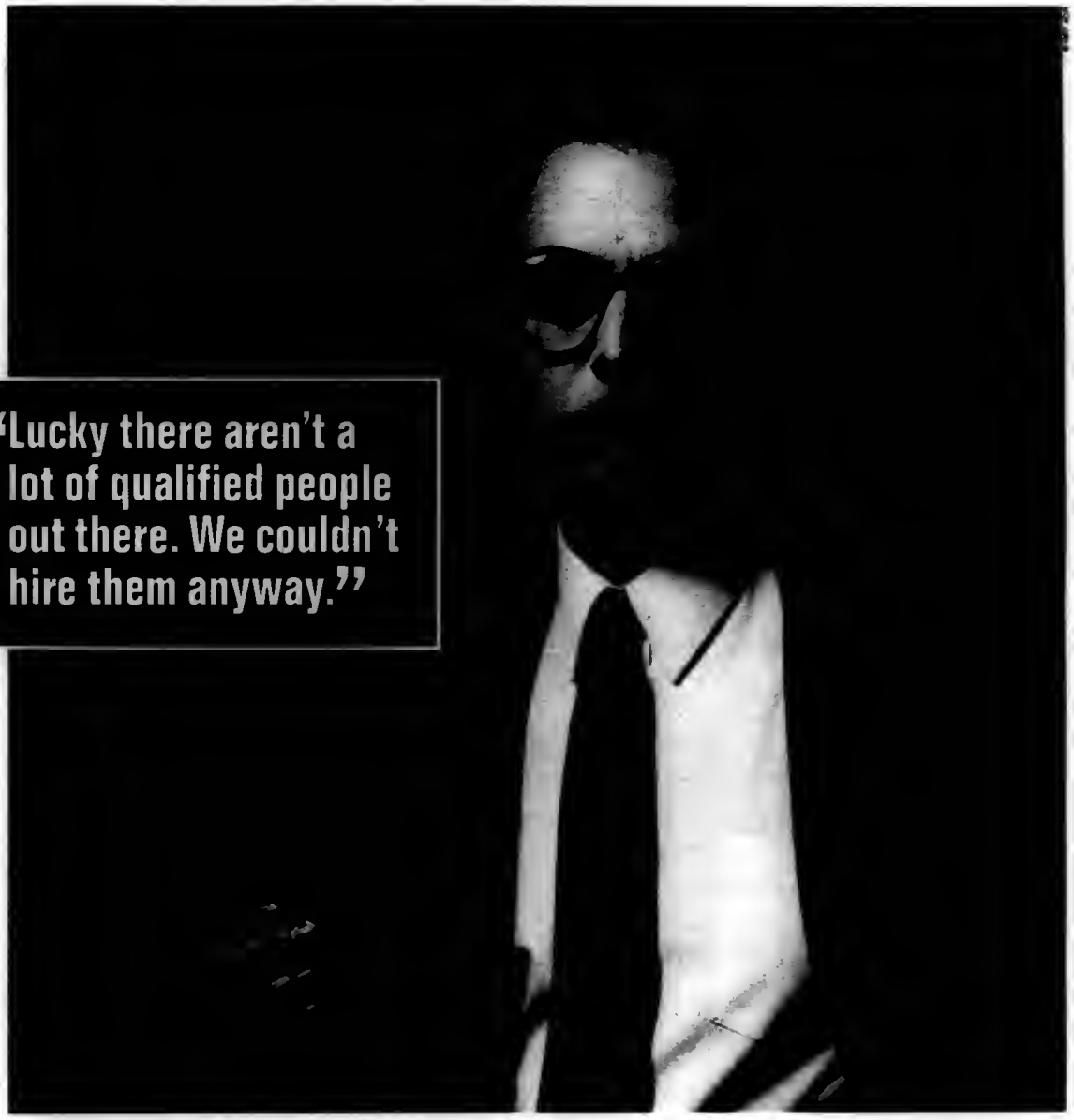
Some operations departments have taken on the relatively sophisticated tasks of systems and maintenance programming from systems programming departments, according to Leonard Eckhaus, president of the association.

Furthermore, increasingly complex configurations have created the need for operations analysts, who often have a programming or systems background and handle performance measurement. That has happened at Amex Systems, Inc. in Edwards, Calif., which does data processing for National Aeronautics and Space Administration research conducted at Edwards Air Force Base, according to Amex operations manager Vickie Morris.

Network management is also providing new career paths in operations at Commonwealth Bank and Trust, N.A. in Williamsport, Pa., operations manager Richard Ludwig said. Such positions require more training than traditional operations jobs, he added.

With on-line processing and local networks requiring data processing professionals to advise end users, operations departments have set up data center and network help desks. "Along with the network come new and additional responsibilities. . . . dealing face to face with end users," said Kerry Jones, operations manager at Life Office Management Association of Atlanta.

At the University of Notre Dame, operations staff members are eager to man the help desk, computing supervisor Reynold Kapsa said. "Operators find it's one of the more rewarding parts of their job. It's not just sitting in front of a console and monitoring something," he added.



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NAS hits maximum XA memory

BY JEFFRY BEELER
CW STAFF

MOUNTAIN VIEW, Calif.— National Advanced Systems Corp. (NAS) last week quadrupled the maximum main memory capacity of its entire IBM 3090-class processor line and accelerated by three months the delivery timetable for the family's two biggest models.

As a result of the memory enhancements, users of the company's AS/XL-series CPUs can now upgrade their systems to support up to 2G bytes of main storage, the largest amount allowable under IBM's Extended Architecture.

To achieve the increased capacities, NAS has equipped all six of its XL models with 1M-bit random-access memory chips and the industry's first 64K-bit storage protection arrays.

The company has also extended the same improved circuit technology to the machines' expanded memory option, which in the wake of last week's announcement is now scheduled to become available one quarter sooner than expected. Use of the 64K-bit arrays has boosted fourfold the XL's expanded memory and has made capacities on the product line's two largest members — Model 90 and Model 100 — as high as 1.9G bytes.

In addition to enhancing its mainframes, NAS last week ended speculation surrounding its long-awaited cartridge tape subsystem by introducing an IBM 3480-compatible device that reportedly supports 6M byte/sec. channels. The arrival of the vendor's Model 7480 marks the National Semiconductor Corp. subsidiary's debut in the cartridge tape subsystem arena.

Rounding out its latest product announcement, NAS increased the number of channels on its XL-90 and XL-100 from 96 to 128. The XL-90 and -100 are now planned to ship in the second quarter, according to Carl Claunch, NAS's director of systems marketing.

If the firm can fulfill its revised delivery commitments, it will become the first plug-compatible mainframe source to have either a three- or four-way processor complex in customer hands, according to Annex Research, Inc.'s head Bob Djurdjevic. "To create a multiprocessor system is no trivial feat, even if a company has a good uniprocessor," Djurdjevic said.

Because the XL-100 corresponds to IBM's 3090 Model 600E, the acceleration of NAS's delivery dates might force Big Blue to rush its recently announced six-way processor to market faster than originally planned, Djurdjevic speculated. Currently, the 600E is still targeted for first customer shipments during the third quarter.

As for increases in the XL family's main memory, NAS's chief aim is to address users whose applications demand especially large amounts of storage, Claunch said. Familiar examples of such applications include computer-aided design and manufacturing systems and time-sharing options environments that support hundreds of on-line users.

Mainframe memory options from leading vendors
IBM compatible

	MAXIMUM Main Memory	*MAXIMUM Expanded Memory*
NAS XL 90, 100	2G bytes	1.92G bytes
NAS XL 50, 60, 70, 80	1G byte	960M bytes
IBM 3090E series	256M bytes	1G byte
Amdahl 5890 series	512M bytes	512M bytes

CW CHART

Users who were contacted last week said the large memory size is more than they now need but could be useful in the future. Banks of Iowa Computer Services, Inc., in Cedar Rapids, Iowa, which uses an NAS 9080 mainframe running MVS/XA, supports only 40 to 50 users with a TSO system that requires a mere 40M bytes of internal storage. "But the banking software that we're using here is getting progressively bigger," according to David Edelsperger, the firm's vice-president of customer services.

The XL line's enhancements will also provide much-needed paging relief for users of VM/HPO, which is prohibited by IBM's 370-series architecture from addressing more than 64M bytes of main memory, Claunch added. To circumvent the restriction, VM/HPO needs access to large amounts of expanded memory.

NAS's 7480 tape-cartridge subsystem, meanwhile, is intended to meet the need for peripherals that operate with 6M byte/sec. channels, which the company added to its XL-series in January. The 7480 also has an optional data compression feature that on average doubles a cartridge's effective capacity by eliminating spaces and redundant bits.

A minimum 7480 configuration consists of a $62,000 controller and one $41,000 storage unit with two built-in drives. The data compression option costs $12,220, compared with $8,455 for the magazine loader.

NAS shows 4381 option

BY CLINTON WILDER
CW STAFF

HANNOVER, West Germany — National Advanced Systems Corp. (NAS) announced two intermediate mainframes at Cebit '87, the international technology trade show that opened here last week.

The AS/VL 50 and AS/VL 60 machines fall into a performance range between the high end of the IBM 4381 series and the low end of IBM's 3090 series. The machines are slated to be available in Europe in May on an early-support basis and in the U.S. in the third quarter.

"These are our gap products," said Bernhard Scheer, Frankfurt branch manager for NAS's West German subsidiary. "They give the 4381 user who is near capacity options besides either installing a second 4381 or upgrading to a 3090 Model 150," he said.

The Hitachi Ltd.-developed CPUs were introduced simultaneously at Cebit by Comparex, the new joint venture of West German vendors Siemens AG and BASF AG. Comparex and NAS market private-label Hitachi mainframes in Europe.

Both of the NAS AS/VL processors employ the high-end AS/XL architecture with the 1M-bit metal-oxide semiconductor memory chip used in the in the AS/XL.

The AS/VL 50 offers 2½ times the performance of the AS/6660 with processing speeds of up to 7.5 million instructions per second (MIPS), according to the vendor. The AS/VL 60 can achieve throughput of more than 10 MIPS, NAS said.

Both machines support IBM MVS/XA and have memory configurable in 32M-byte increments up to 128M bytes. The processors can support up to 15 channels configured for transfer rates of 6M bit/sec. or up to 32 channels at block-multiplexer rates, NAS said.

The AS/VL 50 includes dynamic working storage capacity of 256K bits and buffer storage of 32K bits, while the AS/VL 60 offers double that capacity in both categories. The AS/VL 50 is priced in Germany at approximately $93,100.

U.S. chip makers unite to repel Japanese rivals

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — The Semiconductor Industry Association (SIA) last week announced it plans to establish a research consortium called Sematech to improve U.S. chip manufacturing capabilities but said it has not figured out how to resolve funding and antitrust problems.

SIA officials said they expect to ask the federal government, particularly the Department of Defense, for a major financial contribution. In addition, the venture may need an antitrust exemption from the government.

Industry executives said the Sematech initiative is intended to help the struggling U.S. chip industry stay competitive with Japanese producers.

Sematech, which stands for Semiconductor Manufacturing Technology, is slated to be a nonprofit corporation that will build a prototype low-volume factory to demonstrate next-generation production equipment and manufacturing processes. The advanced technologies developed at Sematech would be transferred to high-volume plants at individual companies participating in the consortium, officials said.

Advances in technology will be sought throughout the manufacturing cycle, including materials, the lithographic process and equipment, defect reduction and quality control, automated manufacturing and computerized data collection, spokesmen said. The concept is supported by the Computer and Business Equipment Manufacturers Association, largely because a robust U.S. chip industry would provide vendors with multiple sources of chips.

Under the board's proposal, the manufacturing consortium would get $200 million a year for five years in government aid, while the private sector would pay $250 million in start-up costs.

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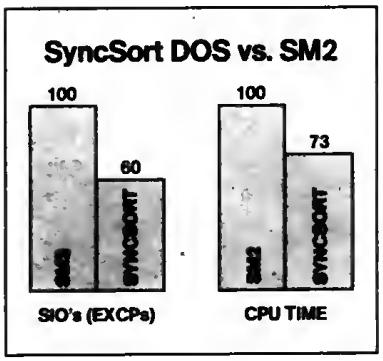

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DEC asserts

FROM PAGE 1

vide our customers with more value for their money."

In a major software price hike, the unlimited VMS software license for a Microvax jumped from $8,000 to $18,000, the vendor said.

Most price increases affected the high-end VAX systems. The just-announced VAX 8530 preconfigured system with 16M-byte memory typically costs $336,000, according to Steve Blanchette, DEC's 8250 and 8350 product manager. DEC said prices for the 8530 start at $291,000, compared with $260,000 for the earlier 8500.

"It's important to note that performance also went up on that system," he noted, referring to the 8530's replacement of the 8500.

A preconfigured 8550 with 32M bytes of memory increased from $398,000 to $464,000. The 8700 with a 32M-byte memory jumped from $483,000 to $546,000, while an 8800 Vaxcluster configuration with a 48M-byte memory soared from $672,000 to $787,000.

In another price move, DEC cut costs for its mid-range VAX systems. The 8250, a replacement for the year-old 8200, was reduced by as much as $19,000, and the 8350, the 8300 replacement, was reduced as much as $26,000, Blanchette said.

Meanwhile, memory and mass storage price cuts have third-party vendors such as Milpitas, Calif.-based System Industries, Inc. and Costa Mesa, Calif.-based Emulex Corp. concerned.

"They're making it very difficult for third parties," observed Larry Tashbook, Emulex director of strategic marketing, storage products.

"The third-party market has clearly demonstrated to DEC that third-party memory was as good or better than what DEC was offering. The issue came down to dollars and cents. Whoever has the lower price will get the business. That's what DEC is reacting to — trying to keep third parties out at whatever cost it takes," he said.

Dan Post, System Industries' director of marketing communications, noted, "We're not particularly worried. Anytime you have a price war in other industries, such as the airline industry, others respond in kind.

"I'm sure other third parties like System Industries will reevaluate their price structures. We intend to remain competitive," Post added. "I think you'll see some aggressive tendencies in our service policies and pricing over the next few months. We consider our primary competitor to be DEC, so we'll make many of those decisions with their announcement in mind."

Price cuts for memory were more significant than price reductions in mass storage. VAX 8250 and 8350 4M-byte memory price dropped from $12,900 to $6,000, Blanchette said. For higher end 8000 systems, which include the 8530, 8550, 8700 and 8800 systems, the 16M-byte memory price was cut from $32,000 to $16,000, he said.

According to a DEC OEM, the Microvax II 8M-byte memory board now costs $2,650, about half its original price. The 4M-byte Microvax II memory board price was cut from $3,500 to $1,350, the OEM said.

The 456M-byte RA81 disk drive price was reduced from $19,000 to $16,000, DEC's Blanchette said. The 2.5G-byte SA482, which was announced in January, retains its $84,000 price tag. The $16,000 price for an RA81 matches the price System Industries announced last month for its RA81 competitor.

Users win license transfer tiff

In response to end-user demands, Digital Equipment Corp. last week reversed a controversial policy prohibiting the transfer of operating system licenses with CPUs sold to a third party.

"We had a lot of discussion with our user community," said Harvey L. Weiss, DEC vice-president of U.S. operations.

"We're reversing our position in the policy. We accept our user concerns and are doing what they asked us to do," he said.

With the new policy, operating systems will be licensed directly to CPUs and transferred automatically with them when systems are sold, Weiss said.

Under the previous licensing policy, which was issued last fall, the original licensee was prohibited from transferring a license to a third party when selling used DEC hardware.

When the previous policy was instituted, the third party was required to obtain a oew VMS license directly from DEC.

IBM image

"It was a smart move for them to make, and it did allay fears that DEC was becoming more and more like IBM in a negative sense," said Richard Mikita, a researcher for Framingham, Mass.-based market research firm International Data Corp.

"It is definitely to DEC's credit that they quickly saw that and reversed their position," Mikita said.

Customers under contract with DEC can now move layered software within a company by simply notifying the vendor. Originally, the customer had to request the move.

The new policy covers both DEC VAX and PDP-11 hardware.

NINAMARY BUBA MAGINNIS

DEC wards off 9370 challenge

Mid-range replacements bolster price/performance edge

BY JAMES CONNOLLY and NINAMARY BUBA MAGINNIS
CW STAFF

MARLBORO, Mass. — Digital Equipment Corp. moved to fill small holes in its VAX product line last week while also apparently trying to broaden any price/performance gaps between it and IBM.

DEC replaced its year-old VAX 8200 and 8300 departmental systems with the more powerful and less expensive VAX 8250 and 8350, reducing the entry price for the VAX 8000 family from the 8200's $79,000 to $65,000 for the 8250. The company also replaced its mid-range VAX 8500 with a VAX 8530 that provides 33% more power. A typical 8530 configuration costs $336,000, said Steve Blanchette, DEC's 8250 and 8350 product manager. A similar 8500 configuration costs $260,000.

The models were introduced only two weeks after IBM announced that it is speeding up deliveries of its 9370 mid-range system by three months, which means some 9370 configurations will be generally available before June.

While IBM's October 1986 introduction of the 9370 is seen by industry observers as an attempt to cut into DEC's advantage in price per millions of instructions per second (MIPS), DEC's most recent announcements restored some of that edge. The 1.2-MIPS 8250 costs $65,000, compared with $93,000 for the 1.3-MIPS IBM 9375 Model 60.

DEC did not announce an upgrade package to convert an 8200 to an 8250 or 8350, although analysts speculated that such an option may be offered later. Instead, the company emphasized the advantages of replacing a 1-MIPS 8200 with a 2-MIPS, dual-processor 8350.

The 8250 is positioned as a lower cost entry system into the Vaxbus interconnect architecture and high-end Vaxcluster technology, according to William R. Demmer, vice-president of DEC's mid-range systems business group.

The VAX 8350 replaces the 8200 and 8300, providing twice the power of the 8200, Demmer said. He added that the 8350 is positioned as the price/performance leader for systems using Vaxcluster technology.

Demmer said the 8530 delivers four times the performance of the 8200, which reportedly would give it a rating of 4 MIPS. He said it is has microcode enhancements that can be added to the 8500 for field upgrades.

While the 8200 and 8300 cannot be upgraded to the 8250 and 8350, analyst Charles T. Casale, director of research for Boston-based market research firm Yankee Group, said, "It is common practice in the industry to announce new models and at some point to decide to offer customer upgrades. Based on everything I have seen, I would be surprised if DEC alienated their customers over this."

Another analyst, John McCarthy of Forrester Research, Inc. in Cambridge, Mass., added, "I would assume there are some new manufacturing efficiencies in the new boxes. It shows you how short product life cycles are getting and shows you how IBM is going to struggle with its traditional five-year life cycle." But, McCarthy warned, DEC may face a problem in that it is changing machines so quickly that users may lose track of its product offerings.

McCarthy said the lower end 8200 and Microvax II have encountered problems competing with equivalent systems from Wang Laboratories, Inc., Prime Computer, Inc. and Hewlett-Packard Co. The new models will help DEC maintain price/performance advantages over the 9370s, he added.

CD-ROM intrigues Lotus, Microsoft, GE

BY PEGGY WATT
CW STAFF

SEATTLE — The still fledgling compact disk/read-only memory (CD-ROM) industry cautiously spread its wings last week as several major vendors announced products or intentions to enter the market. But most development is still tentative or oriented toward vertical markets, and potential users are proceeding with caution as well.

Lotus Developmeot Corp., RCA Corp., Sun Microsystems, Inc. and General Electric Co. were among the companies announcing ventures at the second annual conference on CD-ROM sponsored by Microsoft Corp., which also presented its first CD-ROM product.

A handful of other firms displayed such vertical applications as medical or legal reference retrieval systems. CD-ROM drives under the agreed-upoo High Sierra format standards and even directories of CD resources. The few users attending the conference were scouting available products or testing customized implementations. But much of the discussions remained theoretical. "It's an industry in its larval state," said Richard Green, an analyst and technical consultant for Tec-Ed in Ann Arbor, Mich.

Several new retrieval interfaces paired with data bases were among the conference announcements. Microsoft also announced a new development vehicle. Microsoft Bookshelf is a CD-based collection of 10 reference works, including an almanac, thesaurus, *Bartlett's Familiar Quotations* and a postal zip code directory as well as a built-in retrieval system. The $295 package is scheduled to ship in June.

Lotus, which entered the CD-ROM market last year, with its One Source financial data analysis and update system, took another step by acquiring Computer Access Corp. in Belmont, Mass. Lotus will integrate that firm's Bluefish text search and retrieval technology into Lotus Manuscript word processing applications and other, unannounced products, according to Larry Moore, Lotus director of advanced applications. Lotus did not say when the products would be available.

Sun and Philips Subsystems and Peripherals, Inc., a CD-ROM drive leader, said they will jointly develop an authoring workstation for CD-interactive applications. Availability was not specified.

MIS seeks better Apple support, service

BY PEGGY WATT
CW STAFF

LOS ANGELES — Corporate customers last week said Apple Computer, Inc. has taken a big step in the right direction by releasing an expandable Macintosh that can read Microsoft Corp. MS-DOS data. However, they added that better services and support must soon follow in order for MIS to open its doors to the Macintosh.

Several hundred participants in Apple's National Accounts program, all Fortune 1,000 companies, heard Program Director Tom Strout, Sales and Marketing Vice-President William Campbell and other Apple executives call corporate business a priority this year.

But Apple stopped short of announcing new support or corporate sales programs. A corporate spokeswoman said Apple has focused on beefing up systems and is still developing its corporate services.

The National Accounts program consists of approximately 75 large corporations that Apple solicits for business use concerns and that may buy directly from Apple. The program is less than 1 year old, and its representatives were guests at a two-day Apple World forum last week, at which two models of the Macintosh were introduced. The more powerful of the models, the Macintosh II, boasts a faster processor, color and six expansion slots [CW, March 2].

Many of those corporate attendees said the Macintosh II is an Apple they can justify buying even in an IBM Personal Computer-dominated office.

"Certainly, the Macintosh II will do a lot to get Apple products into business," said Roger G. Stites, vice-president of Security Pacific Data Transmission Corp., an arm of Security Pacific National Bank in Glendale, Calif.

But Apple cannot get in alone, according to Al Holley, manager of Hughes Aircraft Co.'a computer-aided resources management, which already has some 700 Macintoshes in its engineering departments. "The real tools are the software, not the hardware," he said.

Apple has laid the right foundation by releasing more powerful machines and cultivating third-party developers, but it still needs to build a reputation as a serious business machine manufacturer to combat IBM office dominance, some managers said. "The new programs and technology help, but the problem is still changing management's view," an engineering specialist at a major aerospace corporation said. "When you can talk about Macintoshes working with IBM PCs and Digital Equipment Corp. Microvaxes — communicating with them and sharing data — that's what convinces them."

The Macintosh's new capacity to read MS-DOS files is a boon, according to corporate representatives. Several said they did not need the function, but its existence would answer concerns about compatibility with the rest of the systems.

"MS-DOS compatibility is a management caveat, whether it's really needed or not," said Paul E. Lucero, Hughes's consultant with microcomputer services.

Deskpro 286 to speed up

BY DOUGLAS BARNEY
CW STAFF

HOUSTON — Compaq Computer Corp. is set to announce today a speedier replacement for its 8-MHz Deskpro 286 microcomputer.

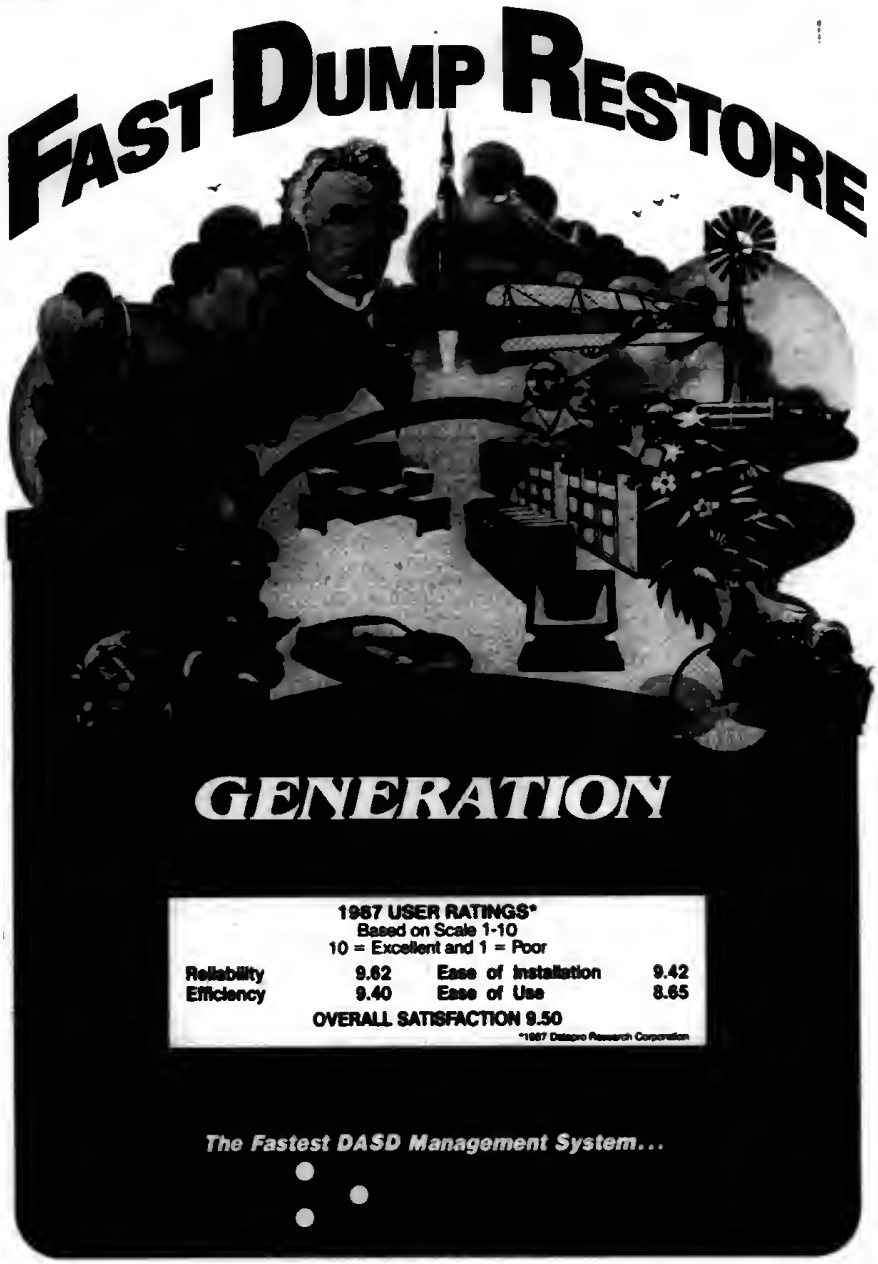
While selling for the same $2,999 in its base configuration, the new line of Deskpro 286 machines run at 12 MHz, and higher priced versions include a faster hard disk drive.

"A lot of the things we do involve heavy number crunching, and we find long periods of time where we wait, wait, wait," said Jon Seebach, director of the central microcomputer function for the certified public accounting firm of McGladrey Hendrickson & Pullen. He added, "12 MHz is much faster for number crunching, and it compiles languages much more quickly." In addition to using faster 286 machines, Seebach has brought in several Compaq Deskpro 386s to speed such processing.

Other machines, such as some versions of the PC'a Limited 286 from PC's Limited, run at 12 MHz, but for Seebach, the wait for Compaq was worthwhile. "There are some benefits to going with IBM or Compaq. If you have clienta or offices in small cities or scattered across the country, then support and maintenance is of key importance," Seebach said. "Yes, some machines are cheaper, but we may have difficulty getting parts, and dealers may not support the product."

For existing Deskpro 286 users, the upgrade path is simple: Buy a new machine. "It is physically possible to upgrade, but we are not offering a specific upgrade. You basically have to replace the entire insides of the new machine," said Michael Swavely, vice-president of marketing for Compaq.

In addition, Deskpro 286 now includes a 192W power supply.



MIS plots micro purchase plan

LAN, Disoss, Unix/Xenix top purchase plans while PC clone use rises

BY DOUGLAS BARNEY
and ALAN RYAN
CW STAFF

FRAMINGHAM, Mass. — Local-area networks (LAN), use of the mainframe for virtual-disk storage of Microsoft Corp. MS-DOS files, IBM Distributed Office Support System (Disoss) file transfer and Unix/Microsoft Xenix operating systems top the list of MIS purchase plans for the coming year, according to a recent survey of 705 *Computerworld* readers. And although IBM's Personal Computer family continues to dominate microcomputer sales to large corporations, cheaper IBM clones are making headway in this market.

The vast majority of respondents to the survey currently have access to a mainframe, using their micro as a terminal. The subjects of the survey have an average of 240 personal computers installed per site.

Most of those PCs were selected by MIS/DP. Nearly 75% of the organizations polled cited MS/DP or an MIS/DP information center as controlling and specifying personal computers purchased for the organization.

Computerworld last week contacted readers to discover the motives behind the broad technological trends.

Unix takes hold

The most stunning revelation is an increase in the use of the oft-maligned Unix and Xenix operating systems. Only 10.8% of the firms queried currently support Unix, but 32.4% plan to support the operating system during the next year. For Xenix, 5.8% support it now, compared with a projected 14.3% by next year.

For Barry Hosking, systems analyst with the O-Cel-O Division of General Mills, Inc. in Tonawanda, N.Y., Unix and Xenix are important issues.

"With Microsoft stalling on their new operating system [a new version of MS-DOS that taps the potential of the Intel Corp. 80286 microprocessor], they may first develop a mix-based system for their 80286- and 80386-based machines which would allow an MS-DOS program to run as a session under a Unix shell," Hosking said in a phone interview last week. O-Cel-O, however, has yet to implement Unix or Xenix on PCs.

The survey appears to indicate that the importance of IBM PC-DOS and MS-DOS, although they are clearly still the leaders among microcomputer operating systems, will wane over the next year as other operating systems gain steam. "[DOS] is running out of gas," said George DiNardo, executive vice-president of the Mellon Bank NA in Pittsburgh.

Mainframes store PC files

The increasing use of PCs is not entirely at the expense of host computers. Virtual-disk storage, already a large area, is poised for tremendous growth. Currently, 26.6% of those surveyed use the mainframe for storage of PC-DOS or MS-DOS files, but 43.2% report plans to use that technology during this year.

One reason for this trend is data security and control, as some hard disks provide a fragile medium for storing data. "It provides us with the capability to archive in a central site," said Dale Preston, director of MIS for Bristol-Myers Co. in Wallingford, Conn.

Others may trust the disks but do not trust the users. "PC users, in my opinion, are not as apt to properly save their files. The fact that they're on a mainframe allows DP departments to save files every day," said Richard Hanson, MIS manager for Braun, Inc. in Lynnfield, Mass.

Clone sales brisk

It will be a good year for vendors of IBM PC clones, according to the survey. While 83.7% of the respondents currently have IBM PCs, only 63.9% intend to purchase more IBM machines in the coming year. "It is usually possible to get the clone cheaper, and it does the same amount of work," said A.S. King, marketing systems development manager for J. C. Penney Co. in New York.

For James Zelle, agency data processing manager for the Connecticut Department of Mental Health in Hartford, clones are appealing because of their lower price. "We have many more clones than we have IBM. Don't forget, you're dealing with state government," he said.

But IBM is still leagues ahead of its closest competitor, Compaq Computer Corp., which will sell machines to 16.5% of the respondents. "The major problem I have with the clones is whether or not they'll be able to fit in with the networking strategies IBM has got on the boards for connectivity," Bristol-Myers' Preston said.

Apple ripe

Although only 9% — compared with 20.4% two years ago — of the respondents chose Apple Computer, Inc. as a PC vendor for the coming year, Apple's MIS fans are an important force.

"We are kind of hoping the Macintosh environment becomes more prevalent than IBM. That environment is so much easier to manage than the PC-DOS or MS-DOS environment," said Larry van Goetham, director of corporate systems for Sara Lee Corp. in Chicago. About one-fifth of the respondents currently have Apple machines installed.

Communications red hot

In communications, LANs, modems and micro-to-mainframe links will be the hot sellers. Each of these technologies is on the purchase lists of more than half the respondents.

According to the survey, many PCs will have several communications capabilities, with close to half acting as a node on a LAN within the next 12 months. Currently, only one-third of the installed PCs are reported to be part of a LAN.

Communications protocols are another area of growth. IBM's Advanced Program to Program Communications as well as LU6.2 use will more than double. But Disoss will lead the file-transfer charge with an increase from the current level, 10.5%, to use in 21.4% of surveyed organizations.

LANs are on the purchase lists of 56% of the respondents. "I am enamored with 3Com Corp. and others who provide a good way to link stand-alone PCs," Mellon's DiNardo said.

Bristol-Myers is heavily committed to LANs, with an IBM Token-Ring network and Rolm Corp. CBX already installed. "The next level of information that is going to need to be moved is images. The Token-Ring not only provides the highway, it provides the speed within the computing architecture we have established," Bristol-Myers' Preston said.

Micros reach out

MIS's current use of micro links and future plans.

Link	MIS Use: Current	MIS Use: Planned
IBM 3270 terminal emulation	76.0%	63.2%
Virtual disk storage of Microsoft Corp. MS-DOS files on the mainframe	26.6%	43.2%
Mainframe-based selection and extraction of the software	23.2%	31.2%
IBM Disoss file transfer	10.5%	21.4%
LU 6.2 protocol	7.1%	17.1%

CW CHART

The buck stops here

Responsibility for control and specifying micros within corporations.

Department	Percent
MIS/DP	59.1
Information center (part of MIS/DP)	14.5
Top company management (non-MIS/DP)	8.4
Administration	6.7
Department using personal computers	5.2
Finance	2.7
Operations (non-MIS/DP)	2.0
Information center (not part of MIS/DP)	1.2
Other	3.0

CW CHART

Lining up micro vendors

Vendors being considered for future micro purchases

Company	Percent
IBM	63.9
Compaq Computer Corp.	16.5
Apple Computer, Inc.	9.2
AT&T	6.9
Zenith Data Systems Corp.	6.0
Hewlett-Packard Co.	3.9
Digital Equipment Corp.	3.2
Leading Edge Products, Inc.	3.2
Wang Laboratories, Inc.	2.8
Toshiba America, Inc.	2.8
Tandy Corp./Radio Shack Corp.	2.6
Epson America, Inc.	2.4
NCR Corp.	2.1
Other	21.9

CW CHART

IBM supports X.400, ties into OSI

BY AMIEL KORNEL
SPECIAL TO CW

PARIS — IBM last week announced here an X.400 message handling system as well as software connecting the firm's Distributed Office Support System (Disoss) to the Open Systems Interconnect (OSI) environment.

IBM also announced enhancements of previously released products that support OSI protocols.

OSI has been added to by the International Standards Organization since 1977 to permit the interconnection of heterogeneous computer systems. The X.400 application provides a common set of protocols for packaging and routing messages between IBM computers and other systems that support X.400. With the introduction of X.400 protocols for the uppermost levels of the OSI framework, IBM for the first time offers product support for the entire seven-layer model, the company said.

Rollout seen coming

The announcement of the IBM X.400 Message Transfer Facility Program Offering is not altogether unexpected. IBM participated last year in a demonstration of X.400 message handling, linking its equipment with systems from International Computers Ltd., Compagnie des Machines Bull, Siemens AG and Nixdorf Computer AG at the Cebit '86 trade show in Hannover, West Germany. Cebit '87 opened its doors last week.

Enhancements of the General Teleprocessing Monitor, Open Systems Transport and Session Service and Open Systems Network Support — all previously released OSI-related products — were also announced.

The two new products and the General Teleprocessing upgrade are to be available during the third quarter of 1988. Availability of Open Systems Transport, Open Systems Network Support and enhancements are scheduled for September.

IBM said that its OSI verification service at La Gaude, France, will support the new products as they become available. The service allows users to verify that their implementations of OSI protocols are compatible with IBM's implementation of the same protocols.

Kornel is a correspondent for CW Communications International News Service's European bureau.

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Iebcopy	67 min. 18 sec.	12 min. 27 sec.	103,486	$131.05
PDSFAST	3 min. 23 sec.	8 sec.	712	$4.22
12 cyl. PDS Copy				
Iebcopy	9 min. 14 sec.	1 min. 20 sec.	10,792	$18.47
PDSFAST	48 sec.	.7 sec.	122	$1.75
47 cyl. PDS Unload to Tape				
Iebcopy	58 min.	14 min. 52 sec.	97,253	$92.05
PDSFAST	4 min. 3 sec.	37 sec.	911	$5.74
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SOFTWARE ENGINEERING OF AMERICA SEA

IBM gives

FROM PAGE 1

Postscript," said Jeff Mason, general manager of IBM's new Publishing Systems independent business unit, in the keynote speech at the Corporate Electronic Publishing Systems conference held here.

Windows has already made its mark in the surging market for desktop publishing by serving as an interface for Aldus Corp.'s Pagemaker software. Last week's announcement, which fell short of an official IBM endorsement of Windows, is a needed lift for the Microsoft environment, which has received only modest support from users and the personal computer software development community.

Only about one in five copies of Windows sold is actually in use, according to figures supplied by Microsoft and the Cupertino, Calif.-based market research firm Infocorp. IBM has avoided committing to any IBM PC-based windowing standard other than its own Topview.

Microsoft Chairman William Gates last week said the IBM announcement is an important boost for Windows, although he cautioned against overinterpreting its impact. "This is just one more step [in Windows' acceptance], though it's a valuable step," he said. "This [IBM] business unit believes Windows is the standard, and I believe that statement will have significant effect on developers doing applications for desktop publishing.

"However, I caution anyone from reading more into this beyond desktop publishing," Gates added.

According to Jonathan Seybold, publisher of "The Seybold Report on Publishing Systems," Windows has clearly beaten out Topview for IBM's publishing products. "Windows is the IBM-sanctioned and preferred operating environment for publishing applications, not Topview," he said. "All of IBM's applications software for publishing will run under Microsoft Windows."

It was still unclear late last week whether Mason's statements meant that IBM will develop software specifically for Windows or simply use an existing product, such as Pagemaker, for its desktop publishing line.

Mason did not elaborate on the role Windows would play in the forthcoming IBM products, except to say that "Windows supports concurrent applications and the information exchange between them." Among those supported are cut-and-paste features that could be useful in a micro-to-mainframe strategy, which IBM has endorsed for its publishing products.

An IBM spokesman would not comment on the level of IBM's commitment to Windows.

IBM, however, did provide some details on its support of Postscript, which the company agreed to license last week from Adobe in Palo Alto, Calif., for future use in an IBM printer.

"We chose Adobe because of its strong customer and vendor acceptance and because of its superior output quality," Mason said. To date, the only way IBM Personal Computer users have been able to use Postscript has been to run a Postscript-compatible application, such as Microsoft Word, on their PCs and print out on a Postscript-compatible device, such as the Apple Computer, Inc. Laserwriter.

IBM is already at work to develop software that will link IBM's Advanced Function Printing Software (AFP) to PC-based Adobe software, Mason disclosed. "We want to be able to download AFP files to Postscript workstations and to upload workstation files to the IBM host for high-speed AFP printing," he said. AFP is used in conjunction with IBM's high-speed 3800 and 3820 laser printers.

All the IBM systems, Mason added, would be compatible with PC-DOS rather than Unix, which is the current platform for many of the most widely used publishing systems. "We're saying that we see PC-DOS as the solution for most of our customers, rather than Unix," he said. However, IBM's RT Personal Computer already runs the Unix-compatible Interleaf system from Interleaf, Inc. in Cambridge, Mass.

IBM's decision to support the PC-DOS, Postscript and Microsoft Windows standards should reassure users that IBM will catch up with the direction already taken at many large corporations, said David Henry Goodstein, president of Interconsult, Inc., a Cambridge, Mass.-based firm. "IBM has told the users to go ahead because they can assure them of future support," Goodstein said.

West Coast correspondent Peggy Watt contributed to this story.

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Vendors' desktop angles vary

BY JEAN S. BOZMAN
CW STAFF

IBM, Digital Equipment Corp. and Apple Computer, Inc. have each targeted desktop publishing as one of the industry's hottest growth areas. Yet they have taken very different approaches to developing products.

At stake is a market that IBM believes will produce at least $1 billion in sales this year and is expected to jump to $6 billion by 1990, according to Jeff Mason, general manager of IBM's new Publishing Systems independent business unit. Mason quoted industry estimates that corporations spend 6% to 10% of their budgets on publishing expenses.

IBM last week outlined a hierarchical approach to corporate publishing, one in which its mainframes will anchor enterprisewide publishing systems. "The host-based systems will interact with corporate data bases, which allows corporations to enforce corporate publishing standards," Mason said.

DEC has taken a different approach, using distributed processing for its publishing systems. The glue for the DEC scheme will be the networking software itself, as well as consistent user interfaces and the VMS operating system in each VAX. DEC announced a full series of hardware and software components, called VAX Integrated Publishing, at last week's Corporate Electronic Publishing Systems show. DEC's publishing scheme leverages its existing network architecture to link Vaxmate and Vaxstation II workstations to VAX host systems.

Apple, whose Macintosh is credited with kicking off the desktop publishing phenomenon, announced that it would support both the DEC and IBM corporate networking schemes for publishing. "We will provide communications into the VAX and IBM worlds," said John Scull, marketing manager for Apple's desktop publishing group.

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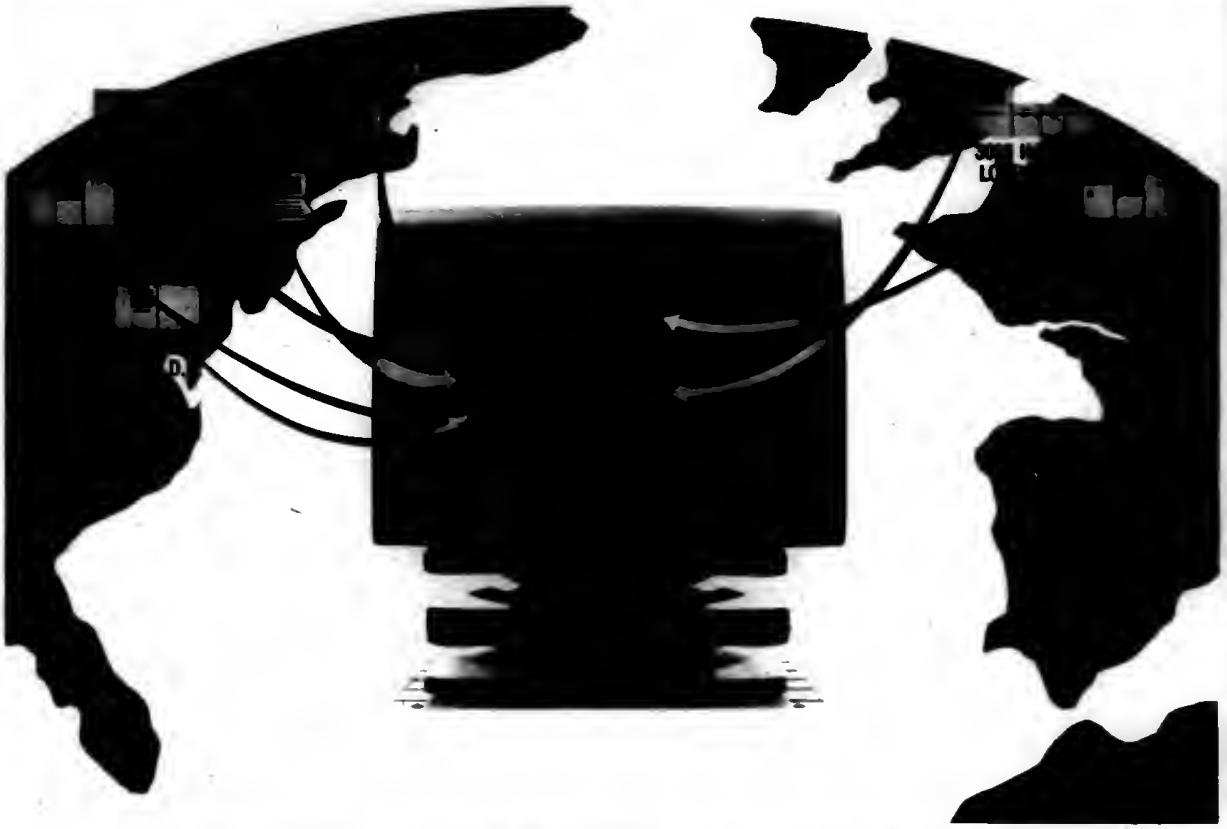

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Uccel cancels ADC2 support, ires users

BY JAMES A. MARTIN
CW STAFF

DALLAS — Two months after its acquisition of The Cambridge Systems Group, Inc., Uccel Corp. has informed users of Cambridge's mainframe scheduling package that it has discontinued marketing that product and will no longer support it after December 1988.

Uccel, in a recent letter mailed to users of Cambridge's Automated Data Center Job Scheduling and Production Control (ADC2), said that "effective immediately, Uccel will no longer offer ADC2 as a marketed product." Instead, the company said it would continue supporting its UCC-7, which competed with ADC2 before the acquisition, as its single production work load scheduling package.

Uccel's decision to drop Santa Clara, Calif.-based Cambridge's ADC2 has aroused the ire of some of its 130 users, at least one of whom is considering legal action. A systems director at a San Francisco-area financial consulting firm, who asked not to be identified, said he has contacted an attorney to review the perpetual license agreement and maintenance contract his company signed with Cambridge Systems Group in mid-1986.

The agreements state that Cambridge is bound to support ADC2 unless the company reorganizes under Chapter 11 bankruptcy laws or there is a breach of contract from either party. The systems director also said Cambridge misrepresented the stability of the company during their spring 1986 meetings. He expressed interest in pursuing a class-action suit against Uccel to block it from discontinuing ADC2 but added that it was too soon to determine the most appropriate legal recourse, if any.

"Our really big concern here is not so much the money but the time involved in retraining my staff on a new scheduling program," he said. It can take up to six months to get everyone over the initial learning curve and another six months until everyone is comfortable using the software, he added.

'Rotten thing to do'

"Simply, it was a rotten thing for Uccel to do," said Andrew Murawski, operations analyst for Falk Corp., an equipment manufacturer in Milwaukee. "Just as we have implemented ADC2 in our data center and finished all the training, we're going to have to reverse the process and start all over again."

Several users said a January letter mailed by Cambridge to ADC2 users in an effort to soothe concerns after the merger now seems unpleasantly ironic. The letter informed users that Cambridge had been acquired by Uccel and added, "the Cambridge products you now have installed will continue to be supported from Santa Clara by the same support staff you have been working with previously."

Uccel realized it would anger some users with this announcement and is offering until April 30 a-free conversion program designed to make the transition "as painless as possible," said Steve Lee, director of marketing services at Uccel's Dallas headquarters.

In the offering, Uccel is making available free to ADC2 users a UCC-7 basic license, data base conversion routine, videotape training and two seats at any regional UCC-7 training seminar. Uccel estimated the value of that offering at $52,360.

A license for the UCC-7 full-function scheduling package and training will cost ADC2 users $7,500, compared with the usual price of $71,360. UCC-7 is normally available for a one-time fee of $49,000 for the basic version and $68,000 for full-function UCC-7. ADC2, by comparison, costs $45,000. Both run under IBM's MVS and MVS/XA.

Several of ADC2's features will be incorporated into UCC-7 eventually, but those features have not been decided yet, said Craig Stull, director of marketing. In the meantime, Uccel has already discontinued marketing ADC2, and development efforts will cease this month as a new release, Version 2.30, is scheduled to ship. Support for Version 2.30 will continue until December 1988.

Following the merger, Uccel decided it would "be confusing and a duplication of effort to develop and support two products that were so similar," said Fred Meyers, UCC-7 product manager. "It makes more sense to take the best features from both and support and develop one product."

The company is not arbitrarily seeking to eliminate a competitive product in favor of its own, Lee said. After the acquisition, Uccel also found itself deciding between its UCC-3 and Cambridge's Automated Storage Management, both of which are mainframe disk management systems.

Although users agreed that Uccel's conversion offering was adequate, they cited lost productivity time and retraining demands as major concerns.

"I work with a small staff, so I have to stop, take the time to train my people all over again, and that's just after we've gotten all three shifts up on ADC2," said Rod Chatfield, specialist for production services at General Electric Co.'s Nuclear Energy Division in San Jose, Calif.

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   - 73 Mining/Construction/Petroleum/Refining/Agriculture
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   - 23 Dir., Mgt., Supvr., Analyst of Systems
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   - 32 Programmer, Methods Analyst
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   - 41 Engineering, Scientific, R & D, Tech. Mgt
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   - 51 Manufacturing Sales Reps., Sales/Mktg. Mgt
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   - E Office Automation Systems
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3317-8719

Wang cutbacks hit top levels

BY ALAN J. RYAN
CW STAFF

LOWELL, Mass. — As part of Wang Laboratories, Inc.'a continuing efforts to pull itself back into the financial black, as many as 27 vice-presidents and 16 department directors are said to have left or been cut from the firm in recent weeks.

One former Wang employee claimed seven of the vice-presidents and 16 directors resigned or were asked to resign on the same day a month ago.

But a Wang spokesman denied the allegation that employees left on the same day, saying the company has been paring down its payroll roster since early this year. He refused to comment on the number of vice-presidents and directors who have left Wang this year.

"We announced back in January that there would be a consolidation of various departments within Wang," spokesman Paul Henning said. At the Jan. 6 announcement, Wang said it would attempt to cut $50 million from its budget by June 30 through a 6% pay reduction for all U.S. salaried employees and through a 1,000-man reduction in the company's work force. The reduction would be realized through attrition and consolidation, the company said.

Wang is saying its attrition and consolidation plan could take up to five months, but one source within the company said that the 1,000-man reduction goal has been met, with about 600 people opting to leave and 400 being laid off. The source added that the cuts are continuing, and that since January, 27 vice-presidents have had their names removed from Wang's employee roster.

Industry watchers contend that all of these vacated jobs prove that Wang had a serious job overlap problem. The source within Wang asserted that while overlap was a significant problem prior to this year, things are becoming more organized.

Sources within Wang and outside of the company claimed the reason the redundant positions were not terminated years ago was because founder An Wang had a strong sense of loyalty to his long-term employees. When his son, Fred, took the company's reigns last fall, he began eliminating the overlap, the sources explained.

A second former Wang employee stated that for the past three or four years, the company has been carrying some officials whose performance has not been up to snuff.

The source referred to problems within the company dating as far back as 1983 and said various vice-presidents were at fault.

'Harboring incompetent people'

Former Vice-President Samuel Gagliano scoffed at the charge that Wang held on to long-term employees who were not doing their jobs. He said Wang was not "harboring incompetent people."

Gagliano, 45, who left Wang last month, said that after spending 20 years at the firm, "I felt I was at a point where I wanted to take a lot of the things I had learned and apply them to general management." He added that he started work earlier this month as the general manager of a small start-up firm.

"My sense is that [Wang is] keeping much of this under wraps so they don't cause a commotion in the financial community" after the heavy financial loss the company suffered in its first fiscal quarter ended Sept. 30, 1986, a former employee said. For that period, Wang recorded a $30 million loss.

Among those who have reportedly left — according to current employees and outside sources — are Edward V. Garcia, vice-president of advanced maintenance development; Stephen Jonas, vice-president of finance and administration; Robert Kolk, vice-president of peripherals and small software development; and Joseph Klementovich, vice-president of manufacturing and customer engineering relations.

Other vice-presidents who have left Wang include Richard Connaughton, vice-president of voice product marketing, who resigned in mid-January; and Ralph Crusius, vice-president and assistant to Chairman An Wang, who retired on Jan. 30 [CW, Feb. 16].

Wang also declined to name directors who have recently terminated their employment with the company.

Daisy Systems puts 80386 to work in latest engineering workstations

MOUNTAIN VIEW, Calif. — Promoting a standard architecture as a key selling point, Daisy Systems Corp. last week announced two computer-aided engineering workstations based on Intel Corp.'s 80386 microprocessor.

The workstations — both based on IBM Personal Computer AT-compatible systems that Daisy purchases from Intel — come with Dnix, Daisy's proprietary version of Microsoft Corp.'s Xenix operating system. The lower end workstation runs Microsoft Corp. MS-DOS as an option, but the high-end system does not.

According to the company, the workstations support the full range of Daisy computer-aided engineering and design applications running under Dnix, such as analog and digital simulation, physical modeling and schematic capture. When configured with Daisy's Ethernet-based local-area network (LAN), the workstations can share a single distributed data base.

Prices begin at $20,000 for the Personal Logician 386 and at $50,000 for the Logician 386. The lower priced workstation includes 2.5M bytes of random-access memory (RAM), a 1.2M-byte floppy disk drive, a 44M-byte hard disk drive, an Intel 80287 math coprocessor and an IBM Enhanced Graphics Adapter.

The base Logician 386 includes 4M bytes of RAM, a floppy disk drive, an 85M-byte hard disk drive, a backup tape drive, a high-performance graphics accelerator and an Ethernet LAN.

DAVID BRIGHT

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NEC stutters, attacks in PC AT arena

BY DAVID BRIGHT
CW STAFF

BOXBORO, Mass. — After a false start last November, NEC Information Systems, Inc. said that it finally plans this week to expand its APC IV IBM Personal Computer AT-compatible system offerings.

The company is scheduled to announce three new systems: a small-footprint system, a more powerful version of the APC IV and a nine-user system running Santa Cruz Operation's version of the Xenix operating system.

NEC had been on the verge of introducing the multiuser version at Comdex/Fall '86 and the other two products shortly afterward, but the company delayed the announcement in order to offer the products together as a family, according to Frank Girard, vice-president of systems marketing.

Beginning in mid-1986, NEC shipped approximately 8,000 APC IV units, according to International Data Corp., a Framingham, Mass., market research firm.

All three new systems are powered by the Intel Corp. 80286 microprocessor and are said to be highly compatible with the PC AT.

Attractive alternative

Because of the Powermate 1's lower price and smaller footprint compared with the AT, NEC said it expects the 8-MHz system to become an attractive alternative to the AT.

The aystem's starting price of $1,995 includes 640K bytes of random-access memory (RAM), a 1.2M-byte floppy disk drive and a hard disk drive controller. PC AT prices begin at $3,395 for a system with 256K bytes of RAM and a 1.2M-byte floppy disk drive.

Powermate 1 options include a 3½-in. internal floppy disk drive for exchanging information with the company's Multispeed laptop system, two 40M-byte hard disk drives and a 40M-byte backup tape drive.

The Powermate 2 is housed in the same box as the APC IV. Improvements include an 8- or 10-MHz, switch-selectable microprocessor and an optional, 66M-byte hard disk drive. The unit can contain up to five storage devices, including a 3½-in. floppy disk drive and a backup tape drive.

Prices begin at $2,595 for a system with 640K bytes of RAM, one floppy disk drive and a hard-disk controller.

NEC claimed it is pitting the floor-standing, multiuser Businessmate system against NCR Corp.'s Tower system. The company said it hopes to sell the system to small and medium-size businesses, primarily through resellers. The system contains multiple intelligent I/O controllers for speeding the operation of connected terminals.

The price for a system with 640K bytes of RAM, one floppy disk drive, one 40M-byte hard disk drive and a monitor is about $6,000.

First-tier company

Now that NEC has a range of AT-compatible products, company officials claimed that the subsidiary of the $13 billion, Japan-based NEC Corp. will be able to make the difficult move from a second-tier vendor to a first-tier one.

"This is the beginning of a very large family of PC products," claimed Dick Miller, director of marketing support. "Until now, we haven't put the full weight of NEC behind our efforts."

Miller said that his company would be able to take advantage of the parent firm's economies of scale and ability to produce most of the parts on its own.

In line with its new aggressiveness, NEC this year plans to bolster its offerings with Intel 80386-based products, Miller added.

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Kodak stalks image systems mart

Aims KIMS at governmental, insurance firms requiring high degree of document storage

BY ALAN ALPER
CW STAFF

NEW YORK — Eastman Kodak Co. last week unveiled an information storage and retrieval system with the ability to access documents stored on microfilm and optical disk drives.

The Rochester, N.Y., firm's Image Management System (KIMS), based on Digital Equipment Corp. VAX processors, is aimed at insurance firms, government agencies and other concerns that require a high degree of storage and access to permanent documents.

Kodak first sketched out the KIMS concept in May 1985, showing an image management system based on an Apollo Computer, Inc. workstation.

Only three of those original systems were delivered, noted Paul Artlip, KIMS program manager with Kodak's Business Imaging Systems unit. "That's all we intended to ship," he said, citing preferred technology evolving from Kodak's joint arrangement with DEC.

Artlip said Kodak intends to ship approximately 80 of the systems to purchasing customers by the third quarter. He declined to provide customer names.

System specs

The entry-level KIMS 3000 is a base-level system using 12-in. optical disk drives. It is aimed at departmental users, small firms and government agencies.

The system features a file server running proprietary image management software, high-resolution workstations and up to two Hitachi Ltd. 12-in. optical drives storing up to 2.6G bytes of information on each side of the disk.

A single-user version of the system, priced at $150,000, will be available by mid-year, Kodak said.

The mid-range KIMS 4500 is an automated microfilm retreival system for users with large archival requirements, according to Kodak. The system is positioned to enable users of existing Kodak microfilm systems to migrate to automated microfilm handling systems, observers said.

Based on DEC's Microvax II with 16M bytes of main memory for indexing and controlling document retrieval, the system features two Kodak microimage terminals, a microfilmer and a robot arm for access and insertion of microfilm rolls into a reader. Two file servers with 456M-byte hard disk drives each also are offered with the system.

Base price of the KIMS 4500 is $150,000. It will also be available by mid-year, Kodak said.

The high-end KIMS 5000 can be used with either robotic microfilm or optical storage jukebox libraries. Any member of the VAX family can be used as the system's engine, the firm noted, though the Microvax II is being used in base-level configurations.

Documents can be digitized or created on the system and stored on optical disks or microfilm. Documents may also be accessed from IBM mainframes via Systems Network Architecture (SNA) gateways or from other systems through the use of protocol converters, Kodak said.

The optical storage jukebox, designed by Cygnet Technologies, Inc. in Sunnyvale, Calif., but manufactured by Kodak, handles up to 121 2.6G-byte 12-in. drives. A microfilm robotic library holds up to 372 rolls of microfilm, enough to store up to four million documents.

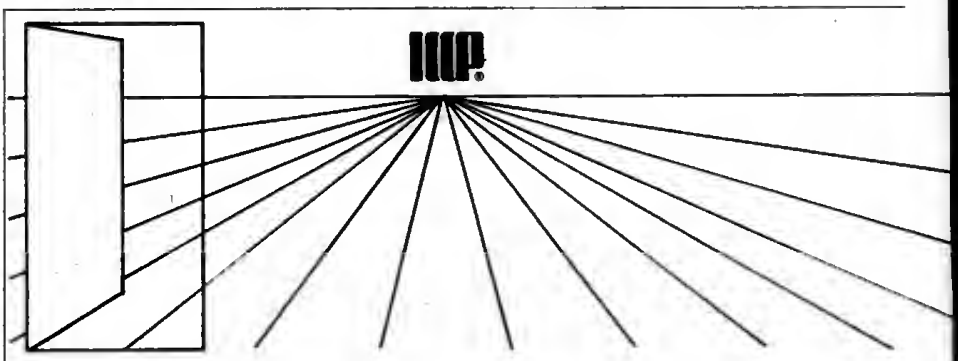
In a six-user configuration, including one storage module — optical or microfiche — a printer mode, file server and tape backup, the system lists for $700,000. Deliveries will begin in the third quarter, Kodak said.

Kodak's 6800 optical disk drive, which debuted at Comdex/Fall '86, will also be offered with the KIMS 5000, the firm noted. The 14-in. write-once system will not be available in volume until early 1988 and will be pitched at large accounts with image-intensive archival storage requirements, according to Kodak.

The drive comes with either a small computer systems interface or the IPI 3 interface for attachment to large systems. Kodak declined to provide pricing, noting that precise figures would be released later this year.

Ray Freeman, president of Santa Barabara, Calif., consulting agency Freeman Associates, Inc., said the Kodak write-once 14-in. optical drive is aimed at a small number of sophisticated users with enormous data base and storage requirements. The market for optical drives in excess of 3G bytes is expected to grow from a handful this year to 3,000 per year in 1991, he said.

So far, Kodak is the sole supplier of 14-in. optical disks, though the firm signed a preliminary second-source media manufacturing agreement with Philips and DuPont Optical Co. in Wilmington, Del., a joint venture of Philips N. V. in Holland and The DuPont Co.



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EDITORIAL

Awash in systems

In Samuel Coleridge's "The Rime of the Ancient Mariner," a marooned and dehydrated sailor is surrounded by the substance that gives life to billions of sea creatures. But he can't slake his incredible thirst, because the water around him is brackish.

The Executive Report on banking, which begins on page 65, points out that large elements of the banking industry are in a similar state. Banks are surrounded by computer technology in which they have invested heavily — some excessively — to compete more effectively and tap new markets

But most banks are struggling to turn this investment into a formidable competitive weapon. And, with the dynamic environment in which banks operate, time to do so is running out.

The problem does not seem to be, as some have suggested, that banks are afflicted with inherently conservative management, at least not any more than other established industries. On the contrary, banks were on the leading edge of acquiring and using large-scale computer systems throughout the 1960s and 1970s. The result of their automation was an effective and cost-saving overhaul of back-shop operations — basically the accounting functions.

The failure, however, has been in the banks' efforts to tie these back-shop systems to front-office analytical functions in some integrated fashion. Sure, the information systems at most big banks can deftly spit out commercial loan or credit-risk analyses. But how many can then link that information to data on overall market conditions, competing market conditions, global politics or risk of certain loans to exposure to any range of exogenous forces? Very few.

That is exactly what today's banks need from their information systems to compete (in addition to sound loan policies, of course).

BURNT ONCE BY SOFTWARE VENDORS peddling "totally integrated" software packages for banks, many banking MIS professionals are understandably wary of such solutions. As the report suggests, the most prudent course for MIS to set in evaluating such solutions is to first determine a reasonable level of expectations.

The most innovative, and therefore the most successful, information managers will be those who exploit the potential of personal computers. Selling this concept will be difficult in such a mainframe-dominated industry as banking.

However, the coming generations of micros will support sophisticated expert systems that can be formidable weapons in the modern bank's arsenal.

Great opportunities for MIS also lie in the exploitation of micros for use in home banking, money transfers, automatic checking and the like, which could unburden banks from handling many of the 45 billion checks that will be written in the U.S. this year.

There is just no excuse for being at sea with so much technology at hand.

Item: *Computer groups endorse transferring authority of data from the NSA to the NBS.*

LETTERS TO THE EDITOR

Paycheck envy

I have been an independent consultant and subcontractor for eight years. During that time, I have come across a few cases of "paycheck envy." So it is not surprising to find out that members of Congress have received letters from employees in favor of Section 1706 of the 1986 tax law [CW, Feb. 2].

I was surprised when one legislative assistant said that he received more letters from employees in favor of Section 1706 than from consultants writing against it.

Those people who wrote in favor of Section 1706 may actually be hurting themselves. If it turns out that all subcontractors must become employees, it is quite possible that many consultants will seek employment with client companies instead of consulting companies.

If this occurs, competition for the most desirable positions will become very tough since in most cases, but certainly not all, subcontractors are of above average competence.

This change in employment patterns has not happened yet, but it could, depending on how the Internal Revenue Service decides to interpret the law.

If Section 1706 remains oo the books, the very employees in favor of it may find that in the future they will have one less career path to follow.

I do not expect employees to join the bandwagon against Section 1706, but they should realize that being in favor of it today may be a mistake tomorrow.

Ray Saperstein
President
Systech
Fairlawn, N.J.

Ethical imbeciles

Your pointed article, "Criminal past of IEEE officer went undisclosed" [CW, Feb. 16], about Stan Rifkin's undisclosed past when documenting his candidacy for a directorship in IEEE's Washington, D.C., local chapter contains a quote that deserves careful scrutiny.

In the article, IEEE member Stuart Katzke states, "People who make amends for their past mistakes deserve a second chance and shouldn't be hounded for the rest of their lives."

This statement may have little or no bearing on the case at hand, for no evidence, as far as can be determined, exists that Rifkin has made amends.

Indeed, his replies (or lack of replies) to investigatory questions suggest little more than an ex-convict attempting to hide from his past.

There is a vast difference between an ex-convict and a reformed person. Merely serving one's time does not expunge the record or automatically turn the criminal into a model citizen. Why bother with an ethics committee when it displays no concern about ethics?

IEEE Capitol-Area Executive Council Chairman Tom Doeppner's justification that he doesn't "feel it's incumbent upon me or anyone else in the IEEE to notify our people about anything either good or bad in someone's personal history" is little short of incredible.

Spitting on the floor or cheating on one's spouse may be no one else's business, but being released from prison only five years before for a felony is most certainly the business of those who are being called upon to vote for the man, especially when most of those voting will know oothing more about him than what is published in the candidate's biography.

If this is the best excuse the local chapter can come up with, perhaps those of us in technical fields deserve the criticism that we are ethical imbeciles and need to be overseen by nontechnical people who understand ethics and the consequences of our technical decisions.

Barbara R. Hunter
Manager
Office Automation
Hazeltine Corp.
Greenlawn, N.Y.

This week in history

March 7, 1977
The Internal Revenue Service continues to fight for congressional approval of its proposed — and controversial — Tax Administration System (TAS) in the face of objections by the Office of Technology Assessment, which claims TAS could violate individuals' constitutional rights.

March 8, 1982
J. Walter Thompson Co., the nation's second largest advertising agency, investigates why someone padded the agency's computer accounting system by $24.5 million. The figure is a combination of fictitious television commercial time and fictitious revenue from the sale of commercial time.

The CIO and the corporate perils of lunch

In the climb up the corporate ladder, let the new executive beware

JOHN L. KIRKLEY

It has become obligatory when writing computer trade publication columns or editorials to at least once a year urge MIS managers to give up their techie ways and become part of the top management team.

It's like planting tulip bulbs in November or noting the return of the buzzards to Hinckley, Ohio, in the spring: It's an annual ritual that grows more familiar and indispensable with the passage of time.

Publications like this one have been printing these little pep talks for years. And perhaps the repetition is justified. For a long time, MIS managers have been caricatured as introverted technologists who deliberately speak in incomprehensible jargon, carry great quantities of leaking ball point pens nestled in plastic nerd packs in the pockets of their shortsleeved shirts and, upon close inspection, are often found to be wearing white socks.

Joe Ferreira, a long-time industry analyst and sometime cynic, once observed, "The DP manager is like the tough Western sheriff that the town fathers bring in to clean up the place. They may have hired him, but they don't invite him to dinner."

In 1984, Ferreira and management consultant Philip Harris wrote, "If information professionals envision themselves as knowledge brokers, they are likely to remain more relevant and in tune with the profound transitions under way in society, in organizations and in roles and relations." They envisioned separate roles for information resource architects who would design the systems, consultants helping the users, synergizers bringing together the many parts of the information system and creating a whole and educators, professional teachers in the true sense of the word.

Since then, MIS has had to adopt all these roles. And now we have another corporate role being hyped — the Chief Information Officer, the path to the top, the Yellow Brick Road to Executive Row.

It appears that, after all these years of editorials — and more important, after the evolution of the information processing function from back-office accounting to providing sophisticated, integrated information networks — the MIS manager is poised on the threshold of acceptance into the top management team.

IN today's business world, a sudden shift in the marketplace might not just mean layoffs among the rank and file; top managers are even more replaceable.

What should the MIS manager feel at this juncture? Pride? Elation? Anticipation?

Fear might be more appropriate.

First of all, no matter how the DP function has changed of late, it is still a highly technical discipline. Those who practice it are drawn to the intricacies of information processing. Deep in their heart of hearts, they feel more comfortable with the certitude of technology than with the shifting sands of corporate politics.

Once they move from the computer rooms to mahogany suites, life will never be the same. The elevated MIS manager must abandon his comfortable world of intricate equipment and impenetrable jargon and learn a new, more subtle language. Executive conference rooms have their own argot, the esoteric language of corporate politics. He must learn the art of the memo, the subtlety of lunch, the delicate matter of choosing the proper person in power to hitch one's star to.

It is ironic that just now, as information processing is being widely recognized as a key competitive resource and that the people who control this resource belong in the top echelons of management, corporate America is undergoing a profound and disturbing change. An article, "Remaking the American CEO," in the business section of the Jan. 25 *New York Times* summarized it neatly. The introduction noted, "Many [CEOs] are adopting a new creed that puts corporate survival above all else. The result: a generation of ruthless management."

The impact of these new management concerns are manifested in daily newspaper reports — massive layoffs, forced early retirements, plant closings and relocations, mergers, bankruptcies and buyouts.

Given this emphasis on survival, short-term profits and crisis management, old concepts such as company loyalty, long-range planning and lifetime employment have become memories of a bygone, gentler era.

In today's business world, a sudden shift in the marketplace might not just mean layoffs among the rank and file; top managers are even more replaceable.

Given these conditions, the MIS manager, newly arrived in the rarefied air of the corporate suites, might have the uneasy feeling that the plush carpet beneath his feet conceals a trapdoor, and that, without his knowledge, someone has painted a bull's-eye on the back of his new three-piece suit.

And so, rather than using this column for the time-honored purpose of exhorting MIS managers to make the move up the corporate ladder, I instead urge caution. If you decide to make the climb, check each rung carefully before ascending. Look for saw marks before venturing on to top management turf. Be careful. There be dragons there.

Kirkley, a former editor of *Datamation* magazine, is an industry consultant currently acting as editorial adviser to Patricia Seybold's Office Systems Group.

In search of CIM: How to create computer-integrated people

JOEL ORR

The real problem with factory automation is people, not technology.

Unless the human obstacles to implementing technological progress are factored into the factory equation, there can be no computer-integrated manufacturing (CIM).

Long after the details of Manufacturing Automated Protocol are resolved, after Initial Graphics Exchange Specification and Product Data Engineering Specification work perfectly to allow information transfer from one computer-aided design and drafting environment to another, after a truly standard version of Unix (or something) permits fully transparent portability of programs and after there are a dozen "magic slots" that really work, enabling us to completely digitize and rectify engineering drawings in seconds, CIM will still have been achieved by only a few companies — and at an expense that will make everyone wonder if it was worth the effort.

In our race for competitiveness in the global market, we have set our eyes on a glorious vision: factories controlled through fully integrated computing schemes. From concept through design, on through manufacturing planning, production and quality assurance, packing and distribution and all the way to field service, a seamless fabric of information processing systems tracks each product, component, purchase, cost, service call and liability suit. (May the latter be few.)

Fresh information

Every detail can be instantly retrieved, reported, totaled, averaged, charted, displayed and assimilated by even the most casual of casual users, like the chief executive officer. The information is always fresh because everything happens through the system; the reporting structure is only incidental to the control structure.

However, the people who scurry about tending this system are viewed by most companies as drones, as interchangeable as the technology they serve. The structure of these organizations is a rigid pyramid.

The high plane of the CIM vision can no more support the weight of manufacturing's hopes than can the two-foot-thick blanket of snow that covers my yard as I write. The beautiful preachments of vendors and consultants would lead one to believe a new level has been attained through technology, and they need only step up on its pristine surface to reach new heights. The reward of those who take that adventurous step, however, is snow in their shoes, wet socks and even pneumonia.

While we are captivated by the artistry (not to say the artifice) of the CIM vision, we ignore the operation of the laws of physics. According to Newton's First Law, a body tends to remain at rest or in motion until an external force is applied to it. His third law says a body will exert a force equal in magnitude, but opposite in direction, to any force applied to it. Anyone who has tried to introduce automation into the factory can testify to the accuracy of these statements in describing manufacturing reality, especially in unionized plants.

But, after all, workers, managers and technocrats all want profits to increase. Perhaps we should simply let well enough alone then and allow change and improvement to take their own course. If we do, however, we run afoul of the second law of thermodynamics — entropy — that states the tendency of the universe is from order to disorder. In other words, chaos is on the increase; anything left to itself runs down.

Thus we are faced with a dilemma: We are compelled to interfere with the way things are if we are to survive; but we are guaranteed resistance if we try to create or maintain order.

The answer is CIP: computer-integrated people. In the current form of organization, it is almost impossible to maintain teamwork; the hierarchical pyramid stifles, perforce, the full functioning and recognition of the individual that are necessary for organic growth and prosperity.

Individual uniqueness

What is needed is organismic management, a view of the company modeled after a dandelion puff or a family cluster, rather than a pyramid. A pyramid, after all, is a place where things are buried. The organismic dandelion or family model is alive and flexible and takes into account the uniqueness of individuals.

In the dandelion, all the seeds are directly connected to the center. In organizations of this type, all workers, on a more or less equal basis, can access the highest level of authority germane to their activities. They feel they are part of a family, rather than a pre-formed niche like a block in a pyramid.

The dandelion-structured suborganization goes through several stages of development: Childhood, in which the central authority tells all the "seeds" what to do; Adolescence, in which the children reason with the central authority and take part in decisions; and Maturity, in which authority is delegated to the children, the dandelion puff breaks up and the seeds blow away to their destiny — the formation of new dandelions. This is the secret of the so-called "excellent" organizations, like IBM and Hewlett-Packard Co.

Planning for CIM offers an excellent opportunity for examining and changing the way the people parts of organizations work. The solutions to the problems of the technological obstacles to CIM are in sight, but they will never be implemented unless we change the organizational framework to truly accommodate people as individuals. The organismic nature of organization must emerge.

Orr is an industrial-automation consultant based in Great Falls, Va. He is writing a book on restructuring the organization for automation, titled *Organismic Management*.

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Steven Pfrenzinger

Clarifying integration

Integrated productivity tools are critical to the successful development of IMS, CICS and DB2 applications. They can be used to reduce training and development costs, minimize risk, improve quality and cut schedules.

However, determining the level of integration of these tools, especially during the evaluation process, can be a major challenge.

It is becoming apparent that the word "integration" has joined the list of data processing terms that require additional clarification.

The definition of integrated software in a popular computer dictionary is "groups of programs that perform different tasks but which share data and often the same presentational format."

With this in mind, let's look at integration as it relates to IMS, CICS and DB2 productivity tools.

Figure 1 (page 24) provides a high-level view of archi-

Continued on page 24

Users applaud prototyping tool

BY ALAN ALPER
CW STAFF

PEARL RIVER, N.Y — Users of The Application Builder (TAB), a microcomputer development environment for Cullinet Software, Inc.'s IDMS/R, have found it to be a powerful prototyping tool and a convenient way of executing mainframe applications on micros.

Users, however, are still waiting for TAB's developer, Online/Database Software, Inc., to deliver promised IDMS/R-compatible facilities that would allow users to begin full-scale application development.

Released one year ago, the $4,000 product was touted as a microcomputer version of Cullinet's ADS/Online applications development environment for mainframes. TAB was envisioned as a method of relieving contention for mainframe resources by shifting programming work to IBM Personal Computer XTs and ATs.

Bruce Resser, manager of data base support at Prucapital, Inc.'s data processing center in Roseland, N.J., said his firm is using TAB for prototyping only after purchasing 25 copies. TAB does not yet fully support all Cullinet IDMS/R facilities, such as ADS/Application (ADS/A) for application-structure definition, Logical Record Facility for system-defined sets and Pageable Maps for reaching maps without scrolling, he pointed out.

"Once we get the three missing components, we'll begin to market it internally as an alternative to developing on a mainframe," Resser said.

Bruce Loeffel, marketing vice-president at Online/Database Software, said ADS/A support was recently made available, although Logical Record Facility and Pageable Maps will be part of Release 2.0. The latter were promised earlier, he said, but were put on the back burner when few customers asked for them.

Resser said TAB was "a fairly immature product" when it was released last year. "It's come a long way, but it's not there yet," he added. Since TAB's debut, eight interim releases have been issued to fix minor bugs and provide needed enhancements, Loeffel said.

Resser and other early users have observed that TAB is slow when performing dialogue generation. They cite performance bottlenecks attributed to Microsoft Corp. MS-DOS's current inability to access the protected mode of Intel Corp. 80286 microprocessors.

"Since you can't access memory addresses beyond 640K bytes, it slows down dialogue generation," Resser said.

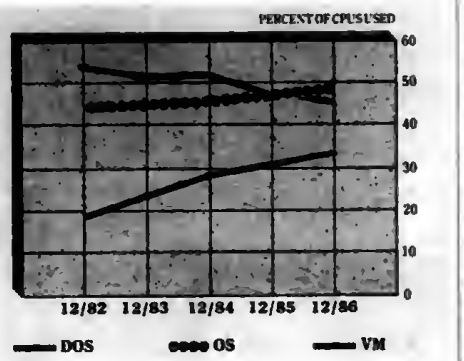
Dialogue generation tends to

Continued on page 24

Data View

IBM operating system history

Older DOS-oriented CPUs, such as the 360 and 370, are decreasing as they are replaced by OS-oriented CPUs, such as OS/VS1, MVS and MVS/XA.



INFORMATION PROVIDED BY COMPUTER INTELLIGENCE CORP

Cullinet plans two DBMSs

BY CHARLES BABCOCK
CW STAFF

WESTWOOD, Mass. — Officials at Cullinet Software, Inc. can envision the day when they will be offering two data base management systems — one networked and one relational — for at least the low end of IBM's 370 mainframes.

But they do not like to hear the phrase "dual data base strategy" mentioned in connection with their approach.

Cullinet is preparing for a fall launch of IDMS/D, a relational product that will appear first on the Digital Equipment Corp. VAX. Cullinet officials acknowledge that a relational product based on a similar architecture will follow at some point for IBM's low-end mainframe, the 9370. IDMS/D is being developed from the relational DBMS acquired from Esvel Co. in San

Continued on page 23

Inside

- Answer Systems' micro-to-mainframe software supports DB2. Page 22.
- Computer Associates updates IBM CICS application development tool. Page 22.
- Kodak software brings integrated computer-assisted retrieval ability to IBM 4300 series users. Page 26.

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Answer micro-mainframe link supports DB2

BY ROSEMARY HAMILTON
CW STAFF

CANOGA PARK, Calif. — Answer Systems, Inc., a division of Sterling Software, Inc., announced recently that its micro-to-mainframe link software now supports IBM's relational data base management system, DB2.

The current version of Answer/DB, which supports IBM's IMS data base management system, is marketed by IBM. Asked if IBM plans to market the new version of Answer/DB, David Saykally, Answer System's president, said he is "not in a position yet to make that kind of an announcement."

The vendor also announced last week that it has begun delivery of Mark IV, its mainframe application development package, with DB2 support.

Answer/DB is designed to provide personal computer users with data from mainframe data bases. In addition to the IBM data bases, the product also includes support for the Cullinet Software, Inc. IDMS and Adabas from Software AG of North America, Inc. Data can be incorporated into the Lotus Development Corp. 1-2-3 or Symphony applications as well as into Ashton-Tate Dbase II, Dbase III or Framework applications.

The package with DB2 support is available this month and will range in price from $45,000 to $200,000, depending on the operating system and configuration. A $45,000 package, for instance, is designed for an IBM MVS-based system supporting 10 personal computers, Saykally said. The software also runs under the IBM DOS and OS operating systems.

The personal-computer module of Answer/DB costs $550. It communicates with the mainframe data bases via 3270 terminal emulation.

MSA The Software Company

February 20, 1987

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Focus goes to RT PC

BY ALAN J. RYAN
CW STAFF

NEW YORK — Information Builders, Inc. has added IBM's RT Personal Computer to the growing arsenal of computers that runs its Focus fourth-generation language.

Focus, a fourth-generation language that is widely used in information centers, also runs on IBM mainframes, Digital Equipment Corp. VAXs, Wang Laboratories, Inc. VS and the AT&T 3B family of computers. The company claimed that applications that are developed on the RT PC can be transported between the machines.

Information Builders said the fourth-generation language software incorporates application development, data base management, reporting and decision-support tools into one environment.

While noting that the RT PC is not a big seller, "we are really committed to putting Focus in all major operating environments," the spokesman added.

He said his firm will be porting Focus to other Unix machines this year, and that "one of the more notable will be the Pyramid Technology Corp. machine."

"Focus for Unix on the IBM RT enables users to design multitasking, multiuser technical applications in engineering, science and CAD/CAM at the departmental level," said Martin Horowitz, Focus for Unix product manager.

Focus offers sort, calculation and format capabilities, as well as program error correction, Help and a user-defined vocabulary. Decision-support tools include graphics, statistical functions, financial reporting and an integrated spreadsheet.

Information Builders' Talk technology includes a series of pop-up windows that guides users through the creation of file descriptions and report requests, the vendor said.

Focus for the RT PC is priced at $7,900 for a one-time license fee and $316 for a monthly license.

System/38 gains SSA data module

CHICAGO — System Software Associates, Inc. (SSA) is offering a performance measurement module for the IBM System/38 that automatically collects data from SSA distribution and manufacturing modules.

Called the Business Planning and Control System (BPCS), it permits management to review performance in distribution and manufacturing against established business plans and pinpoint areas of lag in their early stages, said Robert E. Covey, president of SSA.

The BPCS module can provide percentage increase or decrease, variance from target ranges and out-of-range conditions. It can track inventory accuracy, schedule performance, bill-of-material accuracy, vendor performance and shipments.

BPCS Performance Measurement is available for $6,000.

CICS application product updated

GARDEN CITY, N.Y. — Computer Associates International, Inc. is offering an updated release of its IBM CICS application development product, CA-Flexiscreen.

Release 2.0 includes full arithmetic capabilities, reducing the need to exit from an application under development, a map conversion program to convert Flexiscreen maps into transportable IBM Basic Mapping Support maps and a data verification feature for data entry, Computer Associates spokesmen said.

CA-Flexiscreen is used in IBM's MVS and VSE environments for developing CICS applications. It is priced at $23,000 for MVS and $17,500 for VSE.

Release 2.0 allows users to create and modify forms interactively, directly from the terminal, Computer Associates representatives claimed. In addition, users may access files not defined to CICS through an off-line file table, permitting quick access to new files without disrupting CICS operations, spokesmen said.

Integrated security features control the unauthorized use of files on the applications generated with the product, the spokesmen added.

Cullinet

CONTINUED FROM PAGE 23

Jose, Calif., which in turn was developed in a mainframe VM environment. Since the 9370 will be a VM-based member of the 370 family, it will not be difficult to move IDMS/D onto that machine, according to Jeffrey P. Papows, vice-president of marketing.

At the same time, Cullinet is currently beta-testing a vanilla copy of its flagship product, IDMS/R, on the 9370 at selected customer sites.

Since the one represents a well-established, networked DBMS and the other represents a relational product, they are engaged in what Sharon Weinberg, president of Codd & Date Consulting Group, calls "a dual data base strategy," a phrase that stings when applied to Cullinet. Cullinet officials have frequently criticized IBM's dual data base strategy in promoting DB2.

"IBM has put itself out on a limb," said John Cullinane, chairman of Cullinet, when asked about IBM's dual data base strategy last fall. "They've put DB2 in a lot of places that already use IMS. They've created a tremendous amount of confusion."

Now Cullinet officials worry that some of that confusion may come back to haunt them. "We're going to be very hassled if people conclude IDMS/R is anything less than appropriate for the 9370," Papows said.

When a 9370 is serving as a mainframe at a site, "IDMS/R represents the best possible choice," he said.

When the 9370 is serving as a departmental processor, operating in "unattended" mode, IDMS/D "would be a terrific product offering," he added. "We want to see the physical evidence. We're in a position technically where we can react fast enough to match the DBMS product to the processor use."

MCBA releases Cobol packages for DEC VAX

BY ALAN J. RYAN
LW STAFF

GLENDALE, Calif. — MCBA, Inc. has announced three new packages in its planned 18-module line of accounting, manufacturing and distribution applications for Digital Equipment Corp.'s VAX line of minicomputers.

Written in Cobol, the packages include General Ledger, Accounts Payable and Purchase Order and Receiving. Previously released software includes Inventory Management, Accounts Receivable, Bill of Material Processor and Fixed Assets and Depreciation.

The final product in the VAX Cobol accounting and distribution system, Customer Order Processing, is due for release soon.

"Unlike many other suppliers of business application software, MCBA regularly supplies source code to its licensees," President Stina Hans said. "Consistent naming conventions, modular design, comprehensive documentation and structured coding techniques result in reduced programming efforts in maintaining and modifying the software," Hans said. All MCBA packages reportedly have a multilevel security system that limits access to both data selections and menu selections.

"MCBA's VAX Cobol packages have been designed to be independent of any particular VAX/VMS configuration," said Ken Schilling, the company's DEC product line manager. "They work equally well on single VAXs, VAX clusters or networks, with no additional installation or setup expense."

Suggested retail prices for source code licenses of the VAX Cobol packages range from $3,000 to $6,000 per module for use on the first computer, depending on the specific model in use. Cost does not include installation or training.

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Users applaud

CONTINUED FROM PAGE 19

he slow even on 386-based machines, Resser continued. "While it took our AT 17 minutes to run dialogues, it still took a Compaq Computer Corp. 386 seven minutes. That's still much longer than it takes on a mainframe," he said.

Loeffel claimed Release 2.0 of TAB will resolve 80% of the software and hardware problems associated with slow dialogue generation. He said the new release will speed dialogue generation through more efficient swapping of data in and out of the 640K-byte address space.

Ludwig Slusky, a professor at California State University in Los Angeles, has used TAB since last fall to teach data base design.

"TAB is an excellent example of a prototyping CASE tool," Slusky said.

Slusky's students are using TAB in conjunction with Excelerator, a computer-aided software engineering (CASE) tool from Index Technology Corp. used to do conceptual modeling. Students manually transfer their designs from Excelerator to TAB for prototyping purposes.

"The problem we've had is finding a way to integrate the two," Slusky said. "So far, we haven't found a commercial interface."

Slusky said he would like to see a way for data definitions developed in the concept modeling phase to mesh with the data dictionary created on TAB.

"TAB's response time, flexibility and ease of use is good," he stressed. "The one drawback is that it is assumed by Online/Database Software that the user of TAB is familiar with IDMS and has a rack of IDMS manuals, which is not the case."

Dick Reeser, data base administrator for Holland American Lines Westours, Inc. in Seattle, said his firm has used TAB since last May. Originally, the firm was going to use TAB to "stub up" or build skeletons of systems on PCs and finish development on its mainframe. That plan was scrubbed when the transportation firm did not purchase as many PCs as planned.

Development work at the firm is now being done on a mainframe, Reeser said, although the firm is using TAB to download programs to PCs for training purposes. "We don't want to have our reservation people training with production data," he explained.

Online/Database Software has shipped about 260 copies of TAB, Loeffel said.

In the future, TAB will support multiuser PCs and networked workstations, Loeffel said, adding that the local-area network environment, expected for release early next year, will support IBM's Token-Ring and PC Network. The firm also plans to port the C-based program to Digital Equipment Corp. VAX minicomputers by year's end, Loeffel said.

Clarifying

CONTINUED FROM PAGE 19

tectural integration. Different development tasks related to screens, reports, data and process logic would be considered minimally integrated from an architectural standpoint if their descriptions were stored in a nonredundant fashion on a central repository and used during both the definition and generation processes. Additional architectural integration and ease of use would be achieved if entry panels during the definition phase had consistently structured dialogues with the same presentational format.

Complete architectural integration would also include the substantial advantages of a central respository shared in both the design and development processes, automatic generation of application documentation and verification of the generated code. This verification would automatically guarantee the correctness of the generated code, reduce required testing and identify costly errors earlier in the development life cycle.

Integration of development tasks requires various specification layers to address the variety of application requirements. Figure 2 (page 25) shows these layers as they relate to simple through more difficult requirements.

The higher layers exist to allow simple application requirements to be accomplished using graphics and nonprocedural, fill-in-the-blank features. Entry

Architectural Integration

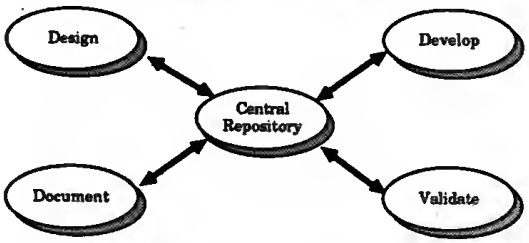

Figure 1

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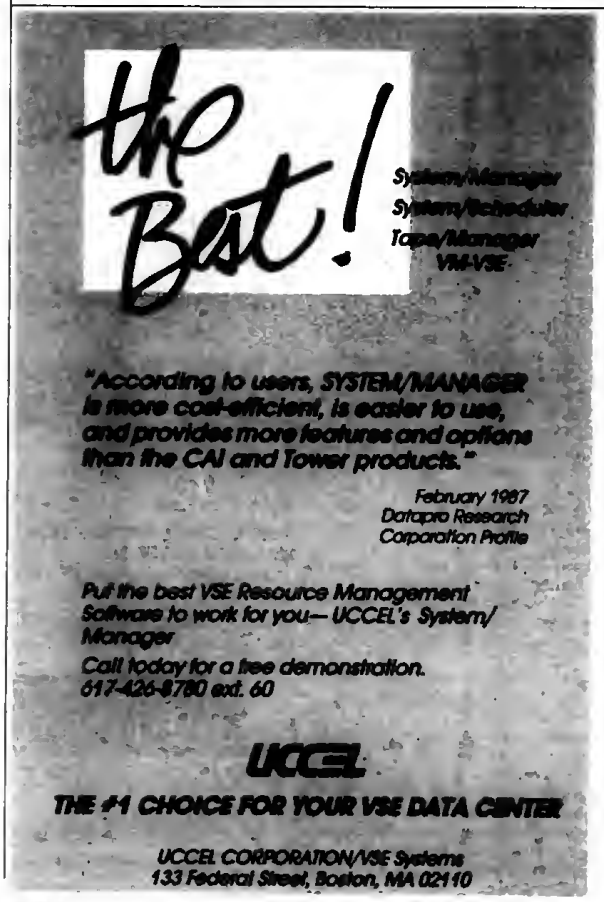

panels with these features are often called painters. Examples of these include screen, data, report, application (system level) and program painters.

The more difficult application requirements use the lower layer, which includes access to a productivity-oriented procedural language, which would include basic IF-THEN-ELSE, PROCESS and DO-WHILE constructs, as well as powerful macro commands. A macro brings productivity and additional syntax to this procedural layer by expanding into multiple statements during a precompile process. A true macro facility brings major productivity improvements by supporting conditional code generation and customized execution routines based on key word values.

The procedural layer allows unique logic to be specified and added at various points defined at the higher layers in the skeletal program. It also allows access to zero-defect common routines in reusable code or macro libraries, which maximize previously written and tested code.

All of this adds up to substantial productivity gains; for example, a traditionally developed IMS application that would normally require that four out of five developers be experienced in IMS could

Specification Layers

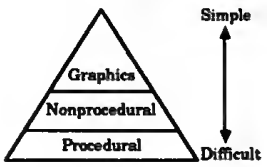

Figure 2

CW CHART

use these specifications layers to cut that number to as few as one out of five.

Integration with the software development life cycle means that a family of tools would provide automated machine handoffs between design, development and maintenance phases. Integration requires that these phases share data on the central respository shown in Figure 1 with the advantage of no throwaway work.

The greatest productivity and quality benefits will come when complete integration supports automated program code generation directly from the design specifications (referred to as fifth-generation tools).

Multiple productivity tools from different vendors sharing different data do not adequately satisfy this requirement and may increase the learning curve and lessen overall effectiveness. This is because the handoff between tools is usually manual, prone to errors and often results in redundancy of effort while using dissimilar tools.

Even though different vendors automate the handoff by passing files from one to another, this would be better described as an "interface" and certainly not deserving of the term "integration."

Sometimes a development tool can double as a design tool because early prototyping capabilities allow the developers and users to develop a full-function working model of the ultimate system, which can gradually be expanded and then be refined.

But the formal design and analysis processes often needed for larger, more sophisticated IMS, CICS and DB2 applications require more than prototyping.

These systems are good candidates for the numerous PC-based systems analysis tools that use a graphics facility and central repository to create, maintain and validate architectural models, data flow diagrams, data model diagrams and structure charts.

Certain vendors have already moved their mainframe development tools to the PC and plan to integrate them with their own graphics-based design tools. This will provide a fully integrated design and development environment and lay the groundwork for automatic code generation, with its obvious benefits. The APS/PC Workstation from Sage Software, Inc. is an example of one of these integrated tools.

Being integrated with IBM's strategic software direction would involve the commitment to and coordination with the most recent releases of IBM's strategic software products, including MVS, MVS/XA, IMS DB/DC, CICS, DB2 and VSAM. This would help secure an investment in existing hardware and software and provide future growth paths with evolving technology. This category of integration means that the vendor has chosen to piggyback on IBM's strategic directions, rather than compete with IBM.

Investigation into the meaning of integration regarding productivity tools reveals a wide range of definitions: everything from "Rube Goldberg type" interfaces to automated machine handoffs between life cycle phases to automated code generation from design specifications.

The benefits of using fully integrated productivity tools are obvious: reduced costs, shorter schedules, minimized risk and higher quality.

So the next time a salesman uses the term "integrated" to describe an IMS, CICS or DB2 productivity tool, ask for a more complete definition.

Pfirrmann is president of IMS Consulting, Inc., an Encino, Calif.-based firm specializing in IBM's IMS DB/DC and CICS/DL/1.

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Manager of Material
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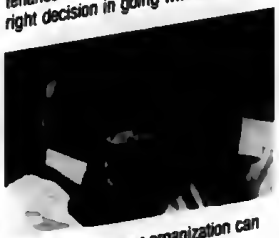
Hess concludes: "When we consider the flexible, but powerful, tools we have to work with and the support we've received under Walker's Warranty Maintenance Service, we feel we made the right decision in going with Walker."



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NEW PRODUCTS

Systems software

Eastman Kodak Co. has announced the **Kodak KAR mainframe system**, software said to bring integrated computer-assisted retrieval capabilities to IBM 4300 series and 3000 series users.

The KAR mainframe system is a generic computer-assisted retrieval package. According to the vendor, users need only add microfilmers, such as the Kodak Reliant intelligent microfilmer 2000, and retrieval terminals, such as the Kodak IMT-150, 250 or 350 microimage terminals, to integrate a full computer-assisted retrieval network.

The software allows integration of such retrieval with the user's present applications.

The KAR mainframe system costs $30,000 for the initial license, with an annual renewal fee of $4,500.

Kodak, 343 State St., Rochester, N.Y. 14650.

Applications packages

Lexadica Software, Inc. has announced **Version 1.0** of its **Nucleus Menu System.**

The menu system is said to enable a Digital Equipment Corp. VAX/VMS system user to build end-user menus. The tool can be used to provide a complete captive environment for the end user.

According to the vendor, the open architecture of the utility allows the integration of applications desired for word processing, spreadsheets and electronic mail.

Other features include screen utility functions, control of user access, session control, directory control, personal files and a pop-up calculator.

Nucleus costs from $715 on the Microvax II to $7,245 on the VAX 8800.

Lexadica Software, P.O. Box 22822, Lexington, Ky. 40522.

Mitrol, Inc. has announced **Mitrol-MSS**, a management summary system designed as a supplement to Mitrol's Manufacturing Resource Planning II package, Mitrol-MFG. The firm also unveiled **Mitrol-ACC**, accounting software for financial management.

Mitrol-MSS is a manufacturing planning and control software package, which uses Mitrol's fourth-generation development language called Mitrol. It provides reports and graphs designed to support proactive management decision making, according to the vendor. The software runs on IBM mainframes. Prices begin at $10,000.

Mitrol-ACC is said to encompass general ledger, accounts payable and receivable, sales orders, cash management, invoicing and fixed assets. It is written in Mitrol and offers an external interface to applications written in other languages. It runs on IBM operating systems under VM or MVS and is priced from $50,000.

Mitrol, 800 Cummings Park, Woburn, Mass. 01801.

Utilities

Software Research, Inc. has announced the **PL/I G-subset Touch Test Suite**, designed to assess the quality and capacity of a PL/I compiler.

The software consists of 86 programs based on a comprehensive feature matrix that has 270 G-subset features organized in strict hierarchical form. Overall, the suite contains 7,649 lines of PL/I text. Both positive and negative tests are included and are designed to illustrate end-to-end operation of the compiler.

The PL/I G-subset Touch Test Suite costs $3,500 for a source license.

Software Research, 625 Third St., San Francisco, Calif. 94107.

X-Tended Computing, Inc. has announced **X-2ools**, a series of productivity tools and aids for IBM DB2 data base users in the IBM TSO/ISPF environment.

Three tools are included in the series.

A Structured Query Language (SQL) source generator allows the user to view DB2 object relationships.

The Data Dumper tool allows the user to create a physical, sequential data set containing the results of any valid SQL Select statement.

Security Cloner enables the user to create the SQL Grant or Revoke statements that are necessary to replicate user security, the vendor said.

X-2ools is priced at $3,500. The price includes maintenance and enhancements for the first year.

Annual renewal licenses for the product will cost the user $525.

X-Tended Computing, No. 202, 1642 S. Parker Road, Denver, Colo. 80231.

Training software

Innovative Software Solutions, Inc. has added a module to its **Teachme/3000** series of computer-based training modules for the Hewlett-Packard Co. HP 3000.

The "Using Vplus Intrinsics" module is intended for HP 3000 users who have need to use HP's Vplus/V screen formatting software.

The module is priced at $750 and is accompanied by the Teachme driver program and an on-line tutorial module.

Innovative Software Solutions, 10705 Colton St., Fairfax, Va. 22032.

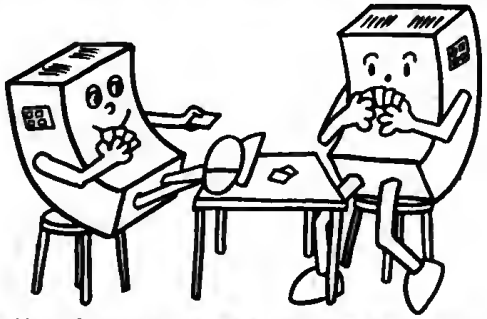
Development tools

Tominy, Inc. has ported its **Mach 1** applications system generation facility to the IBM 9370 computer system running VM with CICS.

Mach 1 includes a full-function logical data base management system, screen-definition facilities and print-definition facilities along with an SQL-based query and report writer.

Mach 1 costs $52,000.

Tominy, Mach 1 Division, 4221 Malsbary Road, Cincinnati, Ohio 45242.



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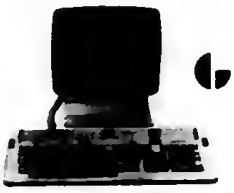

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MICROCOMPUTING

SMALL TALK

William Zachmann

Mindwrite outlines text

One of the most exciting aspects of personal computers is their potential to function as mind enhancers, supplementing and augmenting human thought processes. Outline processing software provides an extremely useful instance of this and, in effect, makes it possible to manipulate and rearrange ideas.

But packages developed as outline processors have, in the past, offered bare-bones word processing capabilities. The ability to handle text paragraphs under outline headings is also quite limited.

Alternately, somewhat limited facilities for developing outlines have been added to some word processing software packages. In these instances, the flexibility and ease of use in creating, organizing and rearranging outlines has typically been more limited than what the outline processors have had to offer.

Mindwrite, a $125 software tool for the Apple Computer, Inc. Macintosh from Carmel,

Continued on page 35

1-2-3: A dangerous language

BY JOHN J. XENAKIS
SPECIAL TO CW

As much as I love Lotus Development Corp.'s 1-2-3, I hate the way it throws out three decades of research on what a good computer programming language should be. Templates written for 1-2-3 are typically uncommented, unstructured spaghetti code.

This is far from a trivial issue, for while few managers like to think of themselves as computer programmers, the fact is that spreadsheet programs like Visicalc 1-2-3 are indeed computer programming languages, especially when you get into things like macros.

"Just as dial telephones turned us all into telephone operators," says Dan Bricklin, the designer of Visicalc, the first spreadsheet program, "Visicalc turned businessmen into computer programmers. It's a historic development."

Even a Lotus official admits 1-2-3's programming shortcomings. "Anyone who regularly uses spreadsheets knows that it's hard work to build a complex worksheet, even harder to debug it, difficult to explain it to other people once it's complete and dangerous to modify it later," writes S. Jerrold Kaplan, principal technologist at Lotus, in *Lotus* magazine.

How can it be dangerous? Here are a couple of lines from a 1-2-3 template that appear in a popular book:

```
G71;+E69*E65+F68*F65+
G67*G65...H126:@IF
(H124<0,@ABS(H124),
@IF(G127>H124,-G127),0));
```

This particular template includes hundreds of lines like these. Maybe one of the Hs should be a K, or maybe a plus sign should be a minus sign. Who knows?

This language is so error-prone that you are literally 50 to 100 times as likely to make a programming error in 1-2-3 as in a well-structured programming language. And that factor goes up exponentially when you try to

Continued on page 34

Apple opens gates for developers

BY PEGGY WATT
CW STAFF

LOS ANGELES — When Apple Computer, Inc. opened its Macintosh system architecture last week by introducing two expandable models, it also opened the floodgates for third-party products that build on the Macintosh line's new capabilities.

"The big news is not what Apple did but what the third-party developers are going to do," said John Sculley, Apple's president. He said the architecture opens the door for innovation in software and add-on hardware design.

The long-awaited connectivity to the Microsoft Corp. MS-DOS operating system was finally unveiled, but it appeared that Apple preferred to let a third party release the products. Although Apple announced add-on cards to let its Macintosh read MS-DOS format data, Apple stopped short of producing a Macintosh that runs MS-DOS.

Continued on page 39

OA package offers choice

BY CHARLES BABCOCK
CW STAFF

Cullinet Software, Inc. said it will incorporate PFS: Professional Write from Software Publishing Corp. into the next release of its integrated microcomputer product, Goldengate.

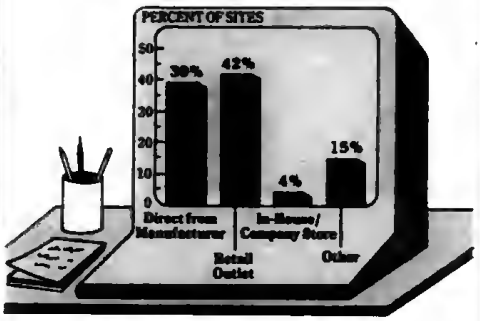
As a result, Release 1.3 of Goldengate, expected in September, is expected to have two word processing programs on its menu. Some may choose to use Professional Write because it is easier to learn than Goldengate's own Edit word processing, acknowledged Cullinet's

Continued on page 35

Data View

Purchase source for personal computers

Medium and large-scale computer sites



INFORMATION PROVIDED BY COMPUTER INTELLIGENCE
CW CHART: SUSAN ALDAM

Inside

- Kaypro enters desktop publishing mart. Page 34.
- Televideo Systems upgrades Telecat-286. Page 40.
- Streamline Software offers software package for laptop computer users. Page 40.

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Kaypro endures fray of 386 clones

BY PEGGY WATT
CW STAFF

Kaypro Corp. joined the early battles of the Intel Corp. 80386 microprocessor-based PC clone wars, but its Kaypro 386 line is still shipping in numbers too small to draw more than curiosity.

The company is also pushing on another increasingly crowded front, with the recent introduction of an Intel 80286-based turnkey desktop publishing system with software and peripherals.

Called Extra Extra, the desktop publishing package is built around the IBM Personal Computer AT-compatible Kaypro 286i. The computer has 640K bytes of random-access memory (RAM), a 30M-byte hard disk drive, an IBM Enhanced graphics adapter-compatible graphics card and monochrome monitor. Extra Extra comes with the 300 dot/in. Kaypro Page Printer II, which uses Hewlett-Packard Co. Laserjet fonts; an applications selection of Ventura Software, Inc.'s Desktop Publishing software; Micropro International Corp.'s Wordstar 4.0, Mailmerge and Correctstar; and Microsoft Corp.'a MS-DOS 3.2.

The complete system is priced at $8,495 and is scheduled to be available April 1. Kaypro said a digital scanner will be available as an option.

Kaypro expects sales of its three 80386-based systems to increase as manufacturing ramps up, according to Frank Valcarcel, network products marketing director.

"We're all working with the same building blocks," Valcarcel said of the growing army of clones that started with Compaq Computer Corp.'s Deskpro 386 last fall. "Sales will be an issue of support, training and the manufacturer'a integrity."

At the top of Kaypro's 386 line is the Model N, designed as a network file server and available with hard disk drives in varying capacities. The Model N has a single 1.2M-byte floppy disk drive and 2.5M bytes of RAM.

The Model A, priced at $4,995, is an entry-level unit with a single floppy drive and a hard-disk controller board. The Model E, priced at $6,295, adds a 40M-byte hard disk drive and 2.5M bytes of RAM.

The 386-based systems have drawn some interest for desktop publishing applications, said Dave Post, sales representative with Computer and Terminals Services, Inc. in Sedona, Ariz. Kaypro also offers professional seminars on desktop publishing applications to promote its new system.

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Three keys! They're all you need to configure Universal Data Systems' new multiport V.33 modem/multiplexer combination. Separate versions offer either six-channel TDM or eight-channel statistical multiplexing capability.

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The three-pushbutton/LCD control panel allows configuration choices (with different data rates for each channel if you desire), "soft strap" settings and easy review of both multiplexer and modem status.

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Diagnostics on both versions of the V.33 multiplexer/modem include local and remote digital loopback on each channel as well as local and remote analog loopback. All test features are compatible with CCITT V.52 and V.54 recommendations.

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HOME of the new V.33 multiplexer/modem is Universal Data Systems, 5000 Bradford Drive, Huntsville, AL 35805. Telephone 205/721-8000; Telex 752602 UDS HTV. Ask for detailed specs and quantity prices.

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Created by Dayner/Hall, Inc., Winter Park, Florida

1-2-3

CONTINUED FROM PAGE 31

modify the program later, when you are probably thousands of times more likely to make an error. That's why Kaplan says modifying a 1-2-3 template is dangerous.

Then what should you use, if not 1-2-3? I just don't know. Javelin, a spreadsheet program from Javelin Software Corp. in Cambridge, Mass., specifically addresses the language problem by providing the same functionality as 1-2-3, with a well-structured language. Still, people complain that it's not a standard like 1-2-3, and they are right.

Dbase III Plus from Ashton-Tate is a standard, well-structured language. It's a data base language, not a spreadsheet language, but many large spreadsheets are really data base applications anyway. To see what the difference is, consider the following program segment in Dbase III:

```
CUST□TOTAL = 0
USE LEDGER
GOTO TOP
DO WHILE .NOT. EOF()
IF LEDGER->TYPE = ."CUSTOM-
ER"
CUST TOTAL = CUST□TOTAL +
LEDGER->AMOUNT
ENDIF
SKIP
ENDDO
```

A person who understands Dbase III would find this program segment much easier to understand, write, modify and debug than the one shown before in 1-2-3 macros. What makes this programming language much less error-prone than 1-2-3 are the mnemonic variable names — like CUST□TOTAL, which obviously means "customer total" — the clear key words — like USE, which specifies which data base to use — and the indenting, which indicates how the program is structured into loops and conditionals. The problem with Dbase III is that most people find it much harder to get started than with 1-2-3.

The solution has to come from Lotus itself. If Javelin and Ashton-Tate can design good languages, so can Lotus. And I know Lotus engineers that would love to take on this project.

For now, be careful. If you can solve your problem in a spreadsheet that fills up only one or possibly two screens, then you are probably all right.

Xenakis is software editor of *Computer Update Magazine*, published by the Boston Computer Society, and president of Xenakis Consulting Services, Inc.

Mindwrite

CONTINUED FROM PAGE 31

Calif.-based Mindwork Software, is unique in the way that it combines a powerful outline processor, a word processor and the ease of use of the Macintosh.

The result is a package that is flexible and powerful yet remarkably easy to use. When you start up the program, Mindwrite appears as a word processor. Mindwrite compares favorably with other word processors for the Mac.

The program has all the basics that come with word processing on the Macintosh: multiple fonts and type styles, the ability to include pictures from graphics applications like Apple's Macpaint and Macdraw, the Clipboard to cut and paste between files and similar capabilities are included.

Mindwrite includes a number of features typically found in more sophisticated word processing packages. Although the software does not provide all the features of more advanced word processing packages — like mail merge, spell checking and thesaurus look-up — it goes well beyond those of a basic package like Macwrite.

Where Mindwrite really stands out, however, is in the embedded outline processing capabilities. Included in the design from the start, these capabilities are competitive with what the best of the outline processing packages have to offer.

An ARRANGE item on the main menu bar makes it easy to move back and forth between outline and word processing modes. An entire document can be created within the context of an outline.

Alternatively, however, outlines or outline segments can be embedded in a document. Hiding and displaying portions of the outline, moving parts of it around, sorting entries and raising or lowering outline levels are simply done.

Outlines can be automatically converted to a section numbering format if desired. Individual segments of the document can be easily moved back and forth between paragraph and outline formats. One very handy feature is the ability to convert a set of outline entries at the lowest levels into a bulleted or numbered list within a paragraph.

Versatile formatting options give the user a great deal of flexibility in arranging the outline format as well as the appearance of the text. Header and footer options make it easy to control the appearance of the final document. Pictures and graphs can be easily included.

A Search menu contains a wide range of search or search-and-replace options, including an assortment of wild-card capabilities. Text can be marked based upon when it was last changed. Automatic table of contents creation is provided. A minor but extremely useful twist is the ability to get a count of words, characters and paragraphs along with an average word length.

Multiple windows in the same document are possible up to the memory limits of the Macintosh. Alternately, windows may be opened for multiple documents. Quickly formatted tiled windowing options are handy alternatives to standard Macintosh window manipulation, which is also supported by Mindwrite. Another useful feature is a simple yet sophisticated Preferences option on the file menu.

Mindwrite is not copy protected, making installation on a hard-disk system a simple matter of dragging the disk to a folder on the hard disk. The package comes on a single-application disk.

All things considered, Mindwrite is an excellent value. It is useful for the Macintosh user who frequently has occasion to be creating and writing documents of some degree of complexity and sophistication, as well as those who want to write casual documents or maintain outlines.

OA package

CONTINUED FROM PAGE 31

Stephen B. Sayre, director of end-user and information-center product marketing.

"Frankly, Edit is a more complex program with in-depth editing features," Sayre noted. Goldengate will continue to include Edit, since many users are accustomed to it, he said.

Goldengate is Cullinet's desktop office automation package that includes spreadsheets, graphics, data base management and an IBM terminal emulator. The Software Publishing PFS series, which now includes the Professional Series, has sold about two million copies. The Professional Series includes word processing, file management and a spreadsheet package. Although the firm does not have any immediate plans to include other programs from the PFS line, it has not ruled out that possibility, Sayre said.

The fall release of Goldengate will also include a personal computer-based report writer, Sayre said. The addition of the report writer will boost Goldengate's memory requirements from 384K to 512K bytes, he added. The addition of Professional Write reportedly does not affect random-access memory requirements because most of the Goldengate applications sit on a disk, with the user selecting the one that he wants to be loaded into RAM.

Sayre said Cullinet will also include Infolink, a $200 micro-to-mainframe link that previously sold separately, in Goldengate. Cullinet is planning to drop the price this fall, according to Sayre. In addition, Goldengate upgrade customers will be able to receive the product at a price that will be less than the cost of Professional Write alone, which is $195, he said.

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Apple opens

CONTINUED FROM PAGE 31

Apple left that to AST Research, Inc. in Irvine, Calif., which announced five expansion boards. Two of the boards enable the models to run MS-DOS applications while the other three enhance the performance of the new Macintosh.

For the Macintosh II, the $1,499 Mac286 board provides IBM Personal Computer AT compatibility with an Intel Corp. 80286 coprocessor and connection to a 1.2M-byte AT-style floppy disk drive. The $599 Mac86 from AST provides similar compatibility to an 8086-based MS-DOS system for the Macintosh SE.

According to AST, the 80286 will allow Macintosh II users to take advantage of Microsoft Corp.'s unreleased operating system, dubbed 286 DOS, that allows 80286-based machines to access up to 16M bytes of random-access memory (RAM).

One area in which incompatibilities may arise is with applications such as Autocad, from Autodesk, Inc., that require particular hardware devices to run or generate output.

The aim of the AST boards, however, is to provide applications-level connectivity, rather than simply the ability to run MS-DOS software. For example, a user of Microsoft's Excel integrated package for the Macintosh could load and view a work sheet from Lotus Development Corp.'s 1-2-3 and then transfer that work sheet to Excel.

Other system enhancement products are the $949 AST-ICP Intelligent Communications Processor to speed the Macintosh II with a Motorola, Inc. 68000 coprocessor, 512K bytes of RAM and four serial ports; the AST-RM4, an $899 memory-expansion unit that adds 4M bytes of memory and can be used as a RAM disk; and the AST-Pak for the Macintosh SE, a family of multilevel expansion products, ranging from memory to coprocessor boards, which begin at $499.

AST said its products for the Macintosh SE are scheduled to be available within a month, and the Macintosh II products will ship in May, when the machine is scheduled for release.

In the communications area, a product that connects the Macintosh SE to IBM mainframes was announced by Avatar Technologies, Inc. in Hopkinton, Mass. The $795 Macmainframe consists of a card that fits inside the SE and software that provides IBM 3278 terminal emulation and file-transfer capability.

A slew of high-resolution monitors were announced by Radius, Inc., Supermac Technology, Sigma Designs, Inc. and Micrographic Images. Supermac also introduced color video boards.

Software was another active area. Borland International announced a $195 Macintosh version of Eureka: The Solver, an engineering calculator. National Instruments, Inc. announced faster versions of its engineering software series, Labview. Microsoft, Living Videotex, Inc. and Cricket Software, Inc. were among those who announced color implementations of their applications.

Another speedup board comes from General Computer Co. in Cambridge, Mass., with the Hypercharger 020 for the Macintosh SE. It has the 16-MHz 68020 microprocessor used in the Macintosh II, plus 1M byte of memory, upgradable to 4M bytes for $1,499.

Other 68000-based expansion boards, designed to give the Macintosh SE some of the power of the Macintosh II, were announced by Levco in San Diego and Peak Systems, Inc.

Another hardware enhancement, a redesigned keyboard with function keys including "cut" and "paste" for the Macintosh, was introduced by Datadesk International in Van Nuys, Calif., and is priced at $169.95. A hardware-software combination system introduced by Lightspeed, Inc. in Boston includes a color scanner, Seiko Instruments U.S.A., Inc. color printer and color page layout system for the Macintosh II and costs $3,500, which includes the Macintosh.

Senior Editor Douglas Barney contributed to this report.

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CW 3-9

NEW PRODUCTS

Systems

Televideo Systems, Inc. has announced the **Telecat-286 EGA**, a package said to upgrade its Telecat-286 IBM Personal Computer AT-compatible system from monochrome.

The upgrade includes an IBM Enhanced Graphics Adapter (EGA)-compatible, 14-in. high-resolution monitor on a tilt-and-swivel base and an EGA adapter card. The Telecat-286 features an Intel Corp. 80286 CPU, a hard-disk controller, graphics controller, keyboard, 1.2M-byte floppy disk drives, 512K bytes of random-access memory, a 20M-byte hard drive, an RS-232C serial port, a parallel port, a clock/calendar and five I/O expansion slots.

The Telecat-286 EGA upgrade package is priced at $995.

Televideo, P.O. Box 3568, 1170 Morse Ave., Sunnyvale, Calif. 94088.

International Instrumentation, Inc. has announced its **Blue Max Atlas** IBM-compatible personal computer.

The Atlas is said to operate at a 13 MHz clock speed. It features 1M byte of 120-nsec memory, expandable to 16 MHz; eight expansion slots; a 1.2M-byte floppy- and hard-disk controller; a 1.2M-byte floppy drive; and a built-in clock calendar.

Optional features include hard disks to 140M bytes, tape backup subsystems to 240M bytes, digitizer, mouse, printers or plotters and an Intel Corp. 80287 math coprocessor.

The Blue Max Atlas is priced from $1,500.

International Instrumentation, Box 3751, Thousand Oaks, Calif. 91359.

Software applications packages

Streamline Software Systems has introduced **Sales Repeater Executive**, a software package designed for users with laptop computers.

The software is said to allow field sales representatives to update customer and prospect files and enter follow-up information during or after a sales call. Reports to home-office management can be transmitted instantly via the laptop's modem.

The product includes a customer and prospect data base, a tickler file, a follow-up file, a weekly sales report, a customer-contact report and a planned sales contacts report.

Sales Repeater Executive costs $495 in either 3½-in. or 5¼-in. formats.

Streamline Software Systems, Suite 1406, 14 Perimeter Center E., Atlanta, Ga. 30346.

Venturcom, Inc. has announced the **Prelude Word Processor**, a module for its Prelude Information Management System for personal computers running AT&T's Unix System V.

The word processor is a menu-driven, function key-oriented program. It offers features such as insert/overwrite mode, Help messages, global/interactive search and replace and options for directories, cursor movement and format and character control on a what-you-see-is-what-you-get screen. The program allows word processing in foreign languages.

The module is said to be integrated with other Prelude modules and can also be used as a stand-alone tool.

The Prelude Word Processor costs $450 for a two-user configuration on IBM or compatible systems.

Venturcom, 215 First St., Cambridge, Mass. 02142.

Software utilities

Core Technology Corp. has ported its **CTC Bridge** products to the Apple Computer, Inc. Macintosh computer.

The CTC Bridge package is said to include Unisys Corp. terminal emulation and file transfer. The terminals emulated are the TD830, MT983 and ET1100 from the former Burroughs Corp. Features include support of multiple-terminal addresses, background-printer address, on-line Help and implementation of the Burroughs Poll/Select protocol.

Line speeds from 300 to 19.2K bit/sec. are supported. The Macintosh may be connected to the Burroughs mainframe via phone lines or Burroughs TDI Direct Connect Interface.

The CTC Bridge package costs $395.

Core Technology, 7201 W. Saginaw, Lansing, Mich. 48917.

Secad has introduced the **Pro-Cad Architectural Menu System** for Autodesk, Inc.'s Autocad Versions 2.18 and 2.5.

The menu system is said to feature door- and window-insertion routines, automatic cleanup and a perimeter walk that automatically generates walls from user-defined length, angle and type.

A plotting utility allows users to view the placement of the drawing before actual plotting, assemble multiscale drawings onto one page for plotting and keep track of text size for the different scales used.

Pro-Cad is priced at $195.

Secad, 4707 S. W. 72 Ave., Miami, Fla. 33155.

Software enhancements

Softway, Inc. has announced **High Screen Version 3.4**, an enhanced version of its user interface development tool.

High Screen is said to offer features such as screen generation, automatic field checking and Help and window management as well as pull-down menu management. Version 3.4 is said to allow the programmer to choose between two modes for each individual data entry screen or window: field-by-field or full-screen mode.

Another new feature is the ability to use vertical scrolling within a zone.

According to the vendor, High Screen can be used with most programming languages, including Basic, Pascal, Cobol, C, Fortran, Dbase and assembler.

High Screen Version 3.4 is priced at $129. Registered owners of previous versions can upgrade for $20.

Softway, Suite 222, 500 Sutter St., San Francisco, Calif. 94102.

Vantex Data Systems has introduced **Version 2.0** of its word processor, **Vantex Word**.

Vantex Word Version 2.0 is said to feature a built-in 90,000-word spelling checker, split-screen capability, macros and unlimited document size. Other features include 30 user-specified defaults, such as automatic backup and time save, eight sorted directory-list formats and diamond cursor movement.

Vantex Word users can move and copy text with repetition or across split screen, move, delete and fill columns and search and replace backward or forward.

Vantex Word runs on IBM Personal Computers and compatibles. It costs $119.99.

Vantex Data Systems, P.O. Box 507, Chatham, N.J. 07928.

Data storage

DMI has announced the **SMI Base Expansion Systems**, products designed to support the Digital Equipment Corp. Vaxmate and PRO lines.

The SMI Base Expansion System consists of an integrated external cabinet with hard-disk controller, power subsystem, cooling system, connecting cable assemblies and documentation.

An additional hard disk, tape backup unit or floppy disk drive can be added to the Base Expansion System.

Four models are available: the DM320A, featuring 60 cycles with 20M-byte hard disk, for $1,595; the DM320B, featuring 50 cycles with 20M-byte hard disk, for $1,845; the DM340A, featuring 60 cycles with 40M-byte hard disk, for $2,295; and the DM340B, featuring 50 cycles with 40M-byte hard disk, for $2,695.

DMI, Suite H, 27635 Forbes Road, Laguna Niguel, Calif. 92677.

Seagate Technology has announced six **3½-in. hard disk drives**.

The drives feature sputtered thin-film media from Seagate Magnetics and open-loop rotary-stepper actuators providing an access time of less than 30 msec.

Featuring an embedded small computer systems interface controller, the ST138N and ST157N provide 30M and 45M bytes of formatted capacity. The ST138R and ST157R also offer 30M and 45M bytes. The ST125 and ST138 feature 20M and 30M bytes of formatted capacities using the ST412/MFM interface.

Prices for the disks range from $495 to $695 in quantities of 500.

Seagate Technology, 920 Disc Drive, Scotts Valley, Calif. 95066.

Tecex has announced the **TEC-OAS/2 Optical Archiving Subsystem** for the IBM Personal Computer, PC XT, PC AT and compatibles.

The TEC-OAS/2 is a 12-in. write once/read many times optical peripheral subsystem. It reportedly provides access of up to 4G bytes of on-line archived data. It can be configured for single-user or multiuser networked system environments.

Subsystem pricing starts at $13,900. Additional double-sided 2G-byte platters cost $475.

Tecex, P.O. Box 6086C, Anaheim, Calif. 92806.

Gil Roeder and his team teach a whole staff C for less than one Seminar fee

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"It's incredible" says a software manager at a Silicon Valley instruments company. "I've never seen programmers get up to speed in C so fast. They get totally drawn in, and they *remember everything*."

Gil Roeder of Hands On Learning, who developed this remarkable workshop, says customers like C for its power and portability, but hit snags getting staff up to speed. "C can be tricky at first. On the job training is too slow and distracts senior staff. Seminars (and travel) are too costly, and often disappointing".

The Solution: Now, the *All Hands On C Video Workshop* gets staff up to speed faster and better than ever before, at far lower cost. The workshop contains six professionally produced video modules that teach the full features and capabilities of the C language from operators and expressions through pointers and structures.

Students review lesson content with workbook exercises, and each module builds practical programming experience with sample programs provided on the C Video Workdisk. The package includes the acclaimed text "Learning to Program in C" by Dr. Thomas Plum, international authority on C and technical advisor to Hands On Learning.

The Secret: Roeder and his company have helped thousands to master computers and software. The secret of their system is its focus on people: using human experience to teach technical concepts. "It's like learning by osmosis" says one student, "I had no idea I was getting so much. When the tapes ended, I just started programming."

The All Hands On C Video Workshop is available in VHS or Beta at $995, and other formats at additional charge. We are sure you will find it an exceptional value. However, if you are not fully satisfied, return it for a full refund for up to 30 days. To order, or for more information, please call us or send this coupon with your business card or letterhead. Thank you.

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NETWORKING

DATA STREAM

Patricia Keefe

Can MHS set a standard?

Last October, Novell, Inc. revealed plans to develop Netware Message Handling Service (MHS), software the firm said would provide message transfer and routing services between local-area networks (LAN) based on Microsoft Corp.'s MS-DOS and minicomputer- or mainframe-based document distribution systems such as Digital Equipment Corp.'s All-in-1 and IBM's Professional Office System (Profs).

With MHS, Novell is proposing to make IBM Personal Computer LANs — and its own Netware in particular — the lynchpin of a corporatewide document distribution system. But it's questionable whether Novell, admittedly a leader in the PC LAN market, can successfully pit its product against the emerging electronic mail standard, X.400.

The success of MHS will depend both on how many companies want to use a PC LAN to tie together disparate systems and how quickly Novell can

Continued on page 42

MIS exerts network control

BY DONNA RAIMONDI and ELISABETH HORWITT
CW STAFF

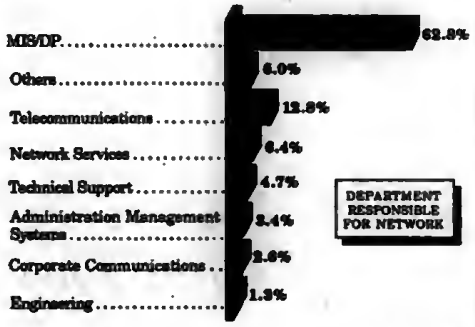
MARLBORO, Mass. — Network management installations are growing and increasingly coming under the jurisdiction of MIS departments at Fortune 1,200 corporations, a recent survey reports.

Of the 269 Fortune 1,200 company sites interviewed by the Market Information Center, Inc., 62.8% said their MIS/DP departments are responsible for managing the corporate communications network (see chart). In contrast, 12.8% of the survey respondents said that their telecommunications departments are in charge of networking operations, and 11% said either network services or technical support departments have

Continued on page 44

Network management

At more and more companies, the buck stops at MIS



INFORMATION PROVIDED BY THE MARKET INFORMATION CENTER, INC
CW CHART

More ISDN offerings on the way

NEC America, Northern Telecom follow AT&T's lead

BY ELISABETH HORWITT
CW STAFF

RESEARCH TRIANGLE PARK, N.C. — Hard on the heels of AT&T's announcement of Integrated Services Digital Network (ISDN) terminals and ISDN Primary Rate support for the firm's System 85, competitors NEC America, Inc. and Northern Telecom, Inc. have revealed ISDN plans of their own.

Northern Telecom research and development subsidiary Bell Northern Research announced the development of Call Manager, an IBM Personal Computer software package that enables the PC and a Northern Telecom telephone to share an ISDN Basic Rate Interface, the company said.

The product provides basic ISDN connectivity for terminals and telephones, forming the basis for future applications that will make use of the ISDN D channel for sending information from one user station to another, said Tony Yuen, Bell Northern Research assistant vice-president of network development. An initial application Bell Northern Research is currently working on is an ISDN-based voice encryption capability, he added.

Northern Telecom has announced no commercial release date for the product. Call Manager is being tested at the Mountain Bell ISDN trial in Phoenix.

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CPE offers DACS, T1 switching

BY ELISABETH HORWITT
CW STAFF

Two companies have announced customer premise T1 switching systems that are based on AT&T's Digital Access and Cross-Connect System (DACS) and offer high-level compatibility with AT&T's DACS-based networking services, the vendors claimed.

Last week, Integrated Telecom Corp. in Richardson, Texas, unveiled the Accudacs 400, a digital multiplexer that can switch 64K bit/sec. DS0 channels among up to four T1 network trunks. The system targets users who want to combine private T1 networking with interfaces to carrier services.

The Accudacs 400, like other Integrated Telecom products, is fully compatible with a wide range of telecommunications protocols used by AT&T and other network service vendors.

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Inside

- X/Open demonstrates Unix standardization initiative. Page 42.
- Cabletron Systems offers repeaters for Ethernet hardware. Page 47.
- Fibronics International unveils full-duplex optical system. Page 48.


```
printf("Hello, world\n");
```

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X/Open offers portability ease

Unix standardization initiative showing mixed results

BY JENNY DE MONTAIGNE
SPECIAL TO CW

LUXEMBOURG — X/Open, the industry group promoting the definition of a standard applications environment for Unix, has demonstrated the portability of software to computer systems supporting the group's standards. Source code from an applications package, Access Technology, Inc.'s 20/20 spreadsheet, was ported to equipment from 10 manufacturers.

At a meeting held here last week for the international press under the auspices of the European Community, X/Open members sought to underscore the achievements of their initiative.

Started two years ago by six major European vendors, X/Open has since been joined by Digital Equipment Corp., Hewlett-Packard Co. and Unisys Corp. Even Unix developer AT&T joined X/Open's ranks recently.

Most X/Open members now offer a Unix version that supports the common applications environment defined by the group. DEC and HP have indicated they will launch products sometime this year.

X/Open also confirmed that its proposed specifications are to be compatible with the Portable Operating System Interface X being defined by the Institute of Electrical and Electronics Engineers.

In January, X/Open published its second Portability Guide, which includes data management, high-level languages such as Fortran, Pascal and Cobol, the integration of applications and internationalization of characters. Other X/Open projects, though, seem to be treading water. A portability center that X/Open intended to set up last year near London is now scheduled to open sometime this year.

Montaigne is a contributor to the CW Communications International News Service.

MHS standard

CONTINUED FROM PAGE 41

generate application support.

The first piece of Novell's MHS strategy was delivered two weeks ago with the release of a developer's kit. Applications utilizing MHS, expected to begin appearing by the end of March, will allow users to put messages, charts — whatever — into an "electronic envelope" for delivery to a stand-alone MHS server on a DOS-based LAN. The server, a PC running MHS software, converts and routes the message to its destination.

MHS's proposed open architecture has the potential for filling a void in the message transfer arena by providing a much needed standard for the transfer of data between unlike systems. However, X.400 also has that potential. Just last week at Cebit '87 in West Germany, 14 European and U.S. computer vendors demonstrated interoperability of their X.400 products.

MHS has generated excitement in the industry, largely because of some very ambitious promises made by Novell. Users on a DOS LAN will be able to send and receive mail to and from Profs, All-In-1 or the Wang Office from Wang Laboratories, Inc., without regard for the recipients' applications, protocols or location, Novell claims.

To enable this message transfer, Novell is building support into MHS for atandard message protocols like X.400 and standard connection protocols like asynchronous communications, IBM's Systems Network Architecture and X.25. In addition, Novell has promised format translation for Profs and All-In-1 to a common DOS format — all by year's end.

That's a monumental undertaking by any definition. Novell detractors have harshly criticized the marketing-oriented firm in the past for announcing products well in advance of delivery dates. Critics point to Novell's diskless workstation and two announcements regarding plans to port the Netware network software to the Macintosh environment. That project has been stalled twice, and "Macnetware" remains vaporware.

Completion date questionable

With all the work that lies ahead, it seems unlikely that a completed MHS product would be available by year's end, especially since it appears Novell is intent upon doing all the work itself.

Also, MHS is located on a PC LAN and will be written to handle traffic between a LAN and specific office systems. It is not intended to facilitate direct message transfer between Profs and All-In-1, for example.

As for X.400, it's unclear whether MHS will wind up facing off against this standard. Novell claims MHS is not only compatible with X.400 as it stands today, but goes beyond it in functionality. X.400 and MHS are not comparable, according to Novell.

Whatever the outcome of these issues, Novell seems to have gone a step or two further in resolving message transfer problems than its competition has. At the very least, the MHS concept is a step in the right direction. Whether Novell can bring that concept to market remains to be seen.

Keefe is a *Computerworld* senior editor, communications.

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MIS controls

CONTINUED FROM PAGE 41

this responsibility.

A study conducted by the Market Information Center approximately one year ago found that 50.7% of respondents said MIS was responsible for network operations. Four to five years ago, the research firm's estimated figure was 30%, according to Barry Gilbert, executive vice-president. He predicts that by the end of the decade, MIS will manage networks for two out of three large corporations.

"Either telecommunications is becoming a subfunction of MIS — with the telecommunications VP reporting to the director of MIS — or you have MIS and telecommunications departments as autonomous entities with independent budgets, with the VPs of each group reporting to a senior executive, such as the VP of finance," Gilbert notes. In the latter instance, telecommunications and MIS departments tend to "communicate on a daily basis" about network operations and planning, he adds.

Approximately half of the respondents with networks say they use a network management system; 8.1% are in the process of evaluating such a system; and 43.4% say they are not using or investigating a management scheme.

"The kind of network management we are talking about here is centralized management facilities for companies networked through various locations," Gilbert explains. "It has only been around for two or three years, and it's growing."

Research results show that the average site surveyed spent $4.1 million in the last fiscal year on communications expenditures — 61% of which was for voice. Typical sites employed 26 people in the communications department, with approximately 5.6% of those people directly involved in network management.

About 70% of the sample had data networks: 46.2% had a voice/data network, and slightly more than a quarter of the respondents said they had a data-only network in place.

"We wanted to look at network importance by industry sector, and we found that the network is most critically important to banking, insurance and finance types and a little less critical to point-of-sale or some retail industries that still send batch information," Gilbert says.

Seven vendors accounted for more than 70% of the total number of network management systems. IBM led the group with 18%, followed by Codex Corp., 15.6%; and Racal-Milgo, 10.2%. General Datacomm Industries, Inc. (9.4%), AT&T Information Systems (7.8%), Paradyne Corp. (6.3%) and Atlantic Research Corp. (4.7%) followed, and Infotron Systems Corp., Digilog, Inc., Digital Communications Associates, Inc. and Infinet, Inc. accounted for less than 3%.

Respondents rated network management systems according to six criteria: ease of use, report generation, overall reliability, restoral capability, traffic rerouting and vendor support. Atlantic Research was at the top in each category and ranked 4.3 out of a possible 5 points overall. General Datacomm followed with a 3.7 rating, Codex with 3.4 and Racal-Milgo with 3.3. The giants, AT&T and IBM, each scored 3.2, and Paradyne bottomed the list with a 2.7 score.

Third-party management

About 20% of large organizations use third-party management services, Gilbert says. "That sector could grow considerably in the next couple of years. Third-party services are being used by large companies with lots of remote locations because they can be cost-justified against the cost of personnel, network management hardware and software, overhead costs and the availability of sophisticated equipment the organization might not want to own," he adds.

Eighty percent of the network management system users said they have remote diagnostic capabilities, while 74% noted that they have service restoral from a central facility. More than half (57.5%) have some backup or redundancy features.

While just less than 9% of the communications budget is allocated for network management, half of the respondents said not enough money is being spent on network management functions. Only 27.7% felt it was adequate, and 22.9% were not sure. The study draws the conclusion that network management costs will be rising for the next three to five years. Respondents cited 50 areas in which they would like to have increased control in their networks. Those areas include error detection, remote-node reporting, problem determination, circuit routing and diagnostics, Gilbert says.

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ISDN offerings

CONTINUED FROM PAGE 41

NEC America told *Computerworld* that it is equipped with technical and production capabilities to ship commercial ISDN terminals in the fourth quarter of this year, with volume shipments targeted for 1988. The firm is currently testing ISDN terminals in the Illinois Bell ISDN field trial at McDonald's Corp. headquarters. The trial began in December.

NEC also said that it was in the final stages of development of an ISDN-compatible module for the NEAX2400 IMS private branch exchange (PBX) system, which could then be used in conjunction with NEC's ISDN terminals. The PBX ISDN interface should be available for shipment this year, NEC said.

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New 8-Channel Codex 6003 Multiplexer

codex

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CPE offers

FROM PAGE 41

according to product manager Thomas Crawford. Compatibility with D4 framing protocols at the 64K bit/sec. DS0 level enables the system to interface with AT&T Accunet T1.5 services and also provides 64K bit/sec. connectivity with AT&T's Customer Controlled Reconfiguration, Megacom, Software Defined Network and M24 services and digital private branch exchanges.

Customers can then route 64K bit/sec. channels through a carrier central office out to company sites that cannot cost-justify a dedicated T1 link, Crawford explained.

The Accudacs 400 also complies with Subrate Digital Multiplexing (SDM) protocols that determine how customer premise equipment and telecommunications services route subchannels down to the 2.4K bit/sec. level, either separately or bundled together into a 64K bit/sec. channel.

AT&T reportedly will announce by the second quarter of this year an SDM service that allows customers to route individual subchannels to different destinations and AT&T services.

Compression capability

Compliance with Advanced Digital Pulse Code Modulation (ADPCM) protocols permits the Accudacs to compress 64K bit/sec. voice channels down to 32K bit/sec. and send both over one 64K bit/sec. band, which can then be transmitted to a carrier's central office-based services, Crawford noted.

Multiple T1 lines can share the ADPCM compression feature on the multiplexer, saving users the necessity to provide an ADPCM module for each T1 link, he added.

The Accudacs uses the Extended Super-Frame (ESF) format so that it can exchange diagnostics and error checking with ESF-compliant telecommunications services such as Customer Controlled Reconfiguration. The system can store up to eight routing tables that can be user-activated to bypass trouble spots on the network, the vendor said.

An entry-level Accudacs 400 configuration with a two-T1 port board costs $8,100. The system can be expanded modularly with X.25 packet assembly-diassembly, voice compression and additional T1 trunks.

Tellabs, Inc. in Lisle, Ill., recently introduced Crossnet, a DACS-compatible nodal processor that routes 64K bit/sec. channels among up to 16 1.5M bit/sec. T1 links. Developed with technical support from AT&T Data Systems Division, Crossnet will be remarketed by AT&T as a customer premise T1 switch called Acculink 740, a Tellabs spokesman stated. AT&T would neither confirm nor deny this statement.

Crossnet provides intelligent switching and dynamic reallocation of 64K bit/sec. channels, DACS-compatible multiplexing, voice compression and packet-switching, the company claimed. The system will accept input from up to 128 voice, data or video channels. The system supports ESF and ADPCM protocols, according to a company spokesman.

Pricing ranges from $13,000 for just the DACS-compatible multiplexer to up to $60,000 for multiple T1 networking. Volume shipping is scheduled for May.

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NEW PRODUCTS

Local-area network hardware

Black Box Corp. has introduced the **Black Box 232 Line Booster** and the **Centronics Line Booster**.

The 232 Line Booster is said to actively receive and retransmit the 12 most commonly used signals of the RS-232C interface, doubling the signal transmission distance beyond the RS-232 specification of 50 ft.

The Centronics Line Booster accommodates the Centronics Data Computer Corp.-compatible printer interface. The 16 most common signal lines of this interface are supported, and the device enables doubling of the cable length typically permitted in a transistor-to-transistor-logic-driven application.

Each device costs $99 and is installed at the center of the RS-232 or Centronics cable.

Black Box, P.O. Box 12800, Pittsburgh, Pa. 15241.

Cabletron Systems, Inc. has announced its **MR-9000C Multiport Repeater** and its **LR-2000 Local Repeater** for use with Ethernet/IEEE 802.3 network hardware.

The MR-9000C port connects up to eight full-length Ethernet segments. The AUI transceiver port is used to connect backbone coaxial or fiber cabling.

The LR-2000 allows expansion of an Ethernet network — up to an overall length of approximately 1.5 miles — by connecting up to five coaxial cable segments.

Both products incorporate the vendor's Lanview built-in diagnostic system. Both offer repeater functions, such as transmission of retimed data packets.

The MR-9000C costs $2,795, and the LR-2000 costs $1,365.

Cabletron Systems, P.O. Box 6257, Cabletron Industrial Park, 10 Main St., E. Rochester, N.H. 03867.

Local-area network software

Dynamic Communications, Inc. has introduced the **Telemark System**, a turnkey software package said to allow the IBM System/38 to directly interface with digital telephone equipment from vendors such as Rolm Corp.

The Telemark System is said to provide information about trunk traffic and extension activity. It also provides cost accounting information. Other features include output report and on-line review capabilities.

Telemark includes 54 display, menu and inquiry screens and 37 reports, all supported by on-line Help, run books and user guides.

The Telemark System is priced from $7,000 to $9,000.

Dynamic Communications, Suite 700, 711 Leyden St., Denver, Colo. 80220.

Network services

Telcomm Marketing, Inc. has introduced a measured-time, long-distance phone and data service called **Z-Tel-II**.

The service is said to provide unlimited, uninterrupted telephone or data transmission service anywhere in the U.S.

Subscribers receive a personal identification number and an access code to activate the service.

Z-Tel-II is priced, on a monthly basis, at $120 for the first 400 minutes and $20 for each subsequent 90-minute segment, no matter how many long-distance calls or transmissions are made, the vendor said.

Telcomm Marketing, Suite 109, The Wharf, Lake Saint Louis, Mo. 63367.

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As a result, Xerox has developed more than just one of the broadest ranges of electronic printing systems—it's one of the most unique. For instance, Xerox 4045 Laser CPs are desktop printers that are also copiers. The two new models have expanded memory capabilities—the Model 20 for IBM 3270 data processing systems, and the Model 50 for desktop publishing and other applications where full-page graphics are needed.

Work groups and small corporate departments have special problems when it comes to electronic printing. Problems the Xerox 2700 and 3700 can solve. Both laser printers are designed for remote printing. The 2700 can produce 12 originals per minute. And the 3700 can produce up to 24 pages per minute on paper sizes up to 11" x 17".

Xerox has electronic printing systems for more intricate needs. The 4060 computer printing system can turn out 60 pages per minute. Its ion-deposition print engine is extremely reliable and an economical way to produce documents with a lot of text. The Xerox 4050 is a laser printer that creates laser-sharp text and graphics at 50 pages per minute.

The Xerox 8700 and 9700 set the standard for high-volume electronic printing. And now, the new 8790 and 9790 take that standard to a new level. These high-volume electronic printing systems give corporate data centers and service bureaus imaging tools that are unsurpassed by anything else on the market. The 9790 can produce up to 120 pages a minute. And can handle both text and graphics, which is critical for so many high-speed applications.

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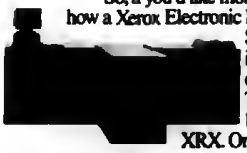

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Customer premise equipment

Isoetec Communications, Inc. has introduced the **Isoetec/Ivie**, a digital voice-mail system designed as an integrated option for the company's computerized System 96, 120 and digital System 228 phone systems.

The product uses disk technology to provide storage, retrieval and forwarding of digitized voice information from an outside caller. Features include automatic call distribution, voice/data switching capabilities, message waiting indication, phone forwarding to voice mail, direct dialing into voice mail, password protection and direct outside access.

The Model 1, priced at $8,800, offers two ports and two-hour voice storage. The Model 2, priced at $11,900, offers two ports and four-hour voice storage.

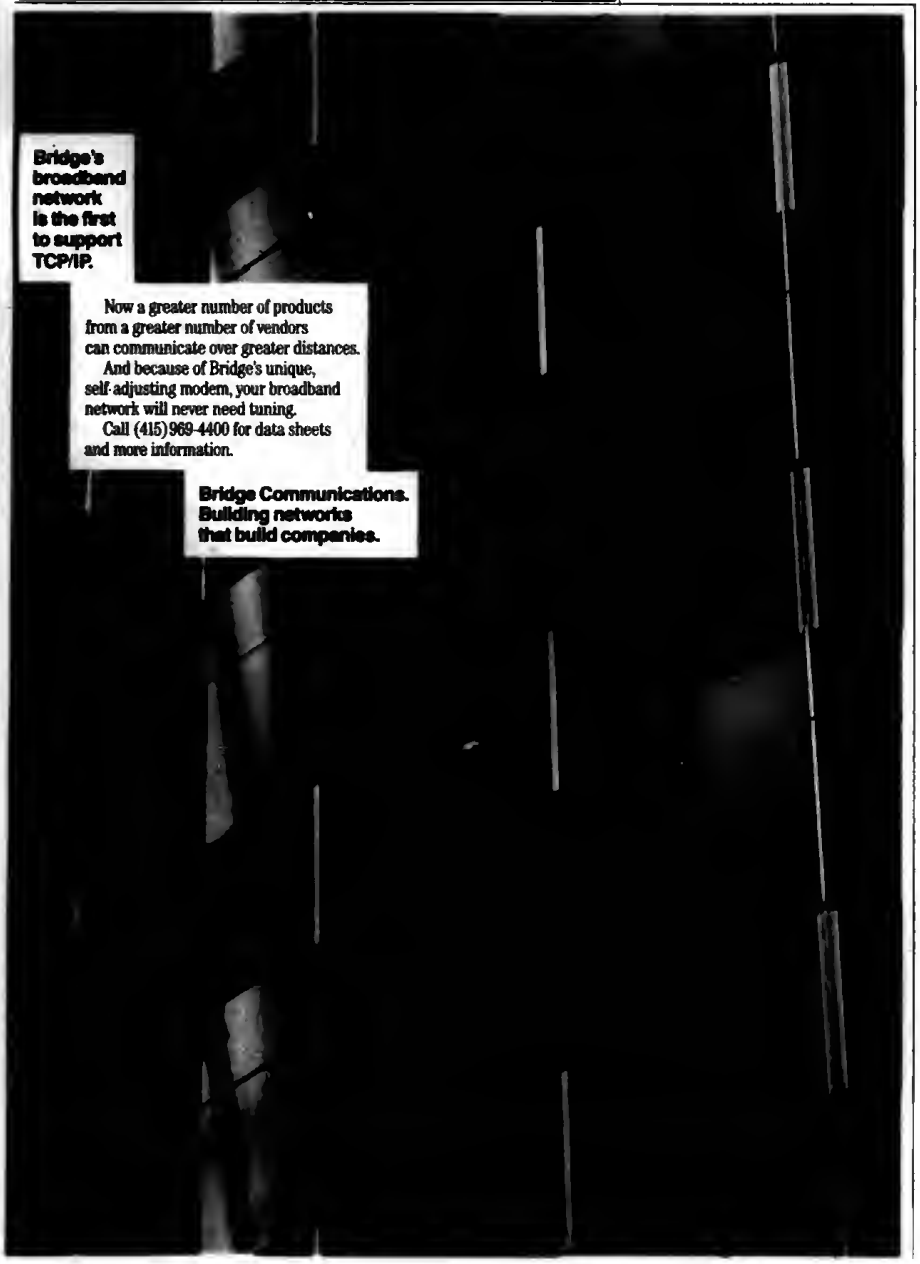
Isoetec, 6 Thorndal Circle, Darien, Conn. 06820.

Fibronics International, Inc. has announced its **Digital Air Link**, a full-duplex optical system said to transmit data on an infrared light beam.

Data can be transmitted through the point-to-point range of 250 meters, as long as there is a clear line of sight. The optical beam is said to be safe, secure and immune from electromagnetic interference. The Air Link was designed for fiber-optic I/O as an added feature for the Fibronics Unimux 832 network system. It consists of two transceiver units.

The Fibronics Digital Air Links are priced at $12,500 per pair.

Fibronics, Communications Way, Independence Park, Hyannis, Mass. 02601.



Links

Tymnet, Inc. has announced **Expresstym**, a service said to allow users utilizing Tymnet's Systems Network Architecture (SNA) Service for IBM mainframes to connect remote personal computers to the mainframes.

Expresstym is software based. It features a customized network gateway allowing access to multiple IBM applications and SNA domains as well as other network services via the Tymnet network. Expresstym also includes an IBM software package providing 3270 keyboard emulation, 10 user-definable soft keys, Help screens and 3287 printer emulation. It also provides Tymnet's protocol conversion and end-to-end, error-free communication via the X.PC protocol.

Expresstym typically costs $8 to $10 per hour, and the PC software costs $175.

Tymnet, 2710 Orchard Pkwy., San Jose, Calif. 95134.

Protocol converters

Palantir Software has announced **Intalk Version 2.11**, a version of its software for modem communications.

Version 2.11 features the Yterm Binary File Transfer protocol for sending and receiving files in the Apple Computer, Inc. Macintosh format to and from IBM mainframes and Digital Equipment Corp. VAX systems. Also included is improved support for Microstuf, Inc. Crosstalk Version 3.6 file transfer protocol.

Intalk is said to run on both Macintosh computers and Microsoft Corp. MS-DOS-based computers under Microsoft Windows.

Intalk is priced at $145.

Palantir Software, Suite 100, 12777 Jones Road, Houston, Texas 77070.

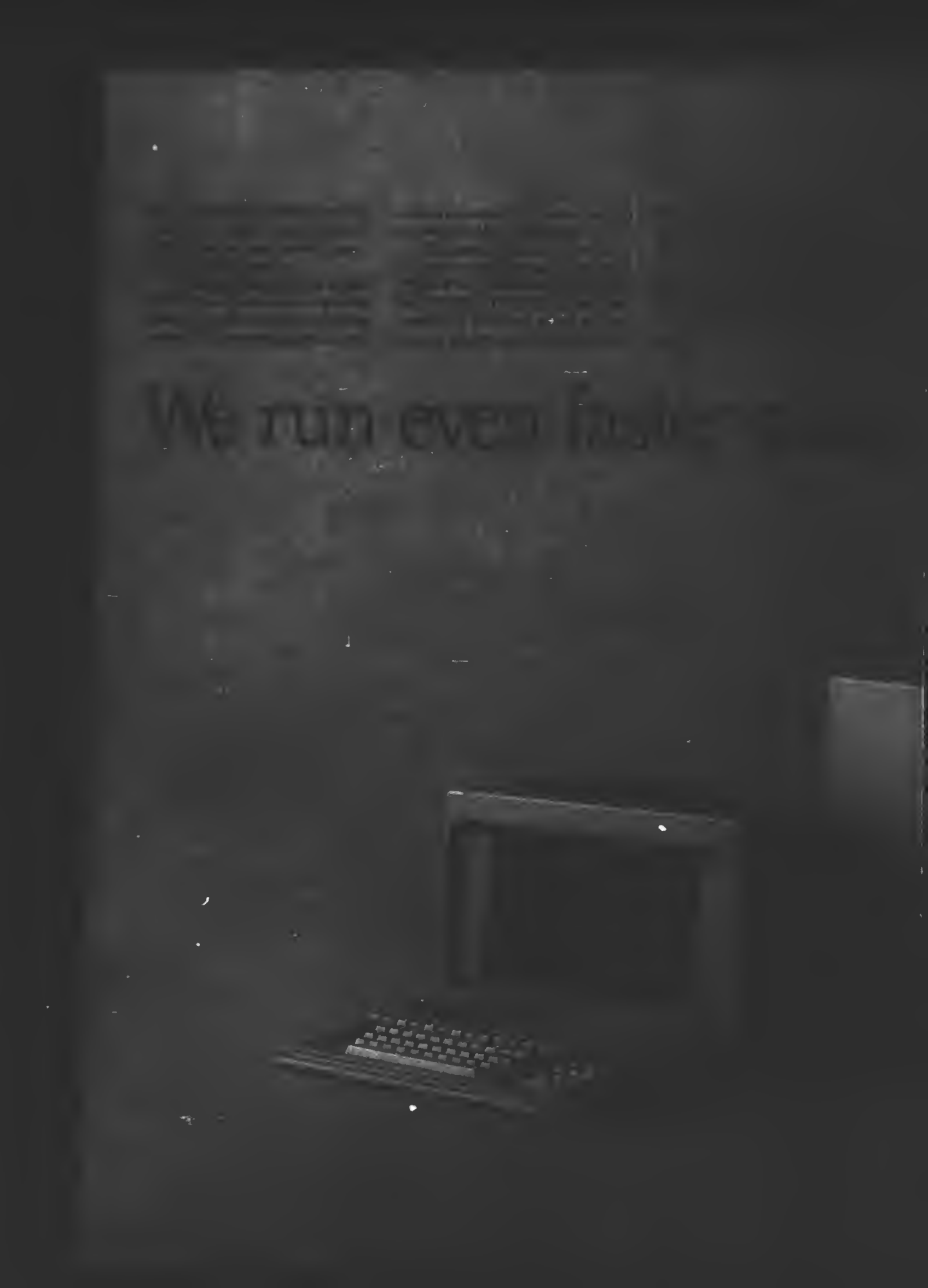
File servers

AST Research, Inc. has announced support for the Appleshare file server software from Apple Computer, Inc. for the **AST-4000** hard-disk subsystem.

According to the vendor, with the incorporation of an AST-4000 or other hierarchical file system-compatible hard disk, the Appleshare software turns an Apple Macintosh into a dedicated file server in an Appletalk network.

The AST-4000 costs from $6,995.

AST Research, 2121 Alton Ave., Irvine, Calif. 92714.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SYSTEMS & PERIPHERALS

HARD TALK

James Connolly

Cray fends off IBM

For a market in which all the players once had niches pretty much to themselves, the supercomputer business is becoming very, very crowded.

Established powerhouses, including IBM, are elbowing for position as start-ups try to sneak in from below. The latest maneuver was carried out by one of those established vendors, Cray Research, Inc., which is looking to drive from its dominant position at the top of the market down to meet the challenge of those that are fighting their way upward.

Cray's recent announcements are meant to fend off the advances of companies such as IBM and Amdahl Corp., which are trying to move from their commercial mainframe bases into the higher end of the scientific and engineering markets.

IBM, which is touting its vector-processing facility for the firm's 3090 mainframe, cannot steal the ultra-high-performance customer who is looking for more and more power from Cray's $17 million Cray-2 supercomputer. But it appears that Cray recognizes the damage companies like IBM and Amdahl can do Cray's X-MP product line — by persuading customers to delay a move to a full-fledged supercomputer if a 3090 and vector processor can meet the user's short-term needs.

Meanwhile, Cray was facing competition from other vendors, including long-time foe ETA Systems, Inc., which is reportedly ready to announce its ETA-10 this month. Some of the others, many of which are still in start-up mode, want to move into the growing supercomputer market by packaging dozens, or even hundreds, of processors in parallel configurations.

Most of those vendors have fallen far short of beating out big Cray systems like the X-MP/416 and the Cray-2. But those vendors offer at least the-

Continued on page 60

IBM 3090 may endure into '90s

BY STANLEY GIBSON
CW STAFF

Recent statements by industry sources indicate the 3090 mainframe will live through 1990, and the 3090's successor, the Summit processor, will not diverge greatly from the 3090 in technology when it does arrive.

George DiNardo, executive vice-president of Mellon Bank, N.A. in Pittsburgh, attended IBM's recent conference for major customers in Orlando, Fla., and said he thinks the 3090 will survive "well into the 1990s."

He also said that IBM would not exceed six processors, even in the Summit machine. "I also gathered that a six-way machine is the maximum they're going. I don't believe they are working on any more software than for a six-way machine."

DiNardo, speaking at a recent Yankee Group conference, said he believes the quadratic processors he has now are insufficiently utilized. "I conclude six-way is the maximum because I'm having difficulty working under four-way. It works like hell under IBM's TSO."

Thomas Henkel, an industry analyst with the Boston-based Yankee Group, predicted Summit will be announced in 1989 and delivered in 1990. In contrast to DiNardo, Henkel said IBM will have an eight-way, 96 millions of instructions per second 3090E model in 1988. In addition, he said, the Summit line will include machines with eight and more processors.

For the remainder of the 3090's life span, all enhancements will be made only to E models, according to Henkel. He added that the next upgrade for the 3090 will include the 4M-bit memory chip IBM recently fabricated.

DiNardo and Henkel agreed that enhanced thermal-conduction modules will be a key to Summit. DiNardo said the thermal-conduction modules will at least double in speed, thanks in part to the use of X-ray lithography in the design of microcircuits. The use of X-rays permits much thinner circuits than does the laser technology now in use.

However, a long 3090 life span raises the question of whether or not IBM will be able to generate sufficient revenue from the 3090 product line to meet its financial goals.

"IBM is at a significant crossroads. The year 1987 will be as bad as 1986 was for IBM," predicted Howard Anderson, managing director of the Yankee Group. He said mainframe sales will never grow as they did in the early 1970s, and said a "real recovery" for IBM is some 36 months away.

According to Brian Jeffery, an industry analyst with International Technolngy Group in Los Altos, Calif., IBM cannot expect to attain high revenue and profit levels with the 3090 and will, for financial reasons, speed up introduction of the Summit. "Recently, every time the financial people at IBM have said 'jump,' the mainframe people have asked, 'How high?'," Jeffery said when asked about IBM's plans.

"There's no way they can last it out for three years, particularly if it means sitting on the 4M-bit chip that's ready to go," he said. He said he anticipates the Summit announcement to take place in 1988.

IBM mainframe power to grow in 1988

Future enhancements to IBM's E models will deliver up to 96 million instructions per second

	100E	150E	120E	200E	300E	400E	600E	800E
E models	-	10.3	18	32	45	54	75	-
E+ models	9	11	20	35	50	60	83	96

INFORMATION PROVIDED BY THE YANKEE GROUP

Lab tests T200 for R&D use

BY ALAN J. RYAN
CW STAFF

LOS ALAMOS, N.M. — The Los Alamos National Laboratory (LANL) here recently installed Floating Point Systems, Inc.'s T200 supercomputer for use in the development of parallel processing.

The computer, manufactured by the Beaverton, Ore., firm, has a theoretical peak performance of approximately 1.5 billion floating-point operations per second (GFLOPS), the vendor claimed. LANL officials said Floating Point ran a preshipment test of the unit at the factory.

"This $6 million system represents the largest T Series configuration installed to date [by]

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Inside

- Start-up develops commercial application for Josephson junction technology. Page 59
- IPL announces 4M-byte memory card for System/38 mini. Page 59.
- Matrox color graphics board for Multibus I out. Page 61

TI develops LISP chip

Federal contract allows commercial production

BY JAMES CONNOLLY
CW STAFF

DALLAS — Texas Instruments, Inc. has announced development of a 32-bit microprocessor designed to support LISP processing while integrating more than 60% of the circuitry of TI's existing two-board Explorer CPU.

The chip was developed under a federal government contract calling for TI to deliver a shoe box-size LISP machine to the Defense Advanced Research Projects Agency (DARPA) in June. However, the DARPA contract allows TI to develop a production version of the microprocessor for the commercial market served by the Explorer.

TI officials said the chip is one centimeter square and contains 553,687 transistors. It was designed to run off chip microcode and execute microinstructions and simple macroinstructions.

In addition to six random-access memories totaling 114K bits, the chip contains a 16K-bit read-only memory. TI said the chip was designed to be memory intensive to provide broad manipulation and branching capabilities to support LISP.

TI said the microprocessor is five times more powerful than the Explorer CPU.

Floyd Hollister, director of TI's Computer Science Center, said the LISP chip will make it easier to package artificial intelligence systems for applications.

"There are lots of places where people want to put expert systems, but the environment is too hostile for current machines, or they are inappropriate. This type of machine should be able to fit in those places," Hollister said.

HP says A400 mini delivers more power at lower price

BY STANLEY GIBSON
CW STAFF

PALO ALTO, Calif. — Hewlett-Packard Co. has introduced the Model A400, an entry-level single-board minicomputer in its HP1000 line of real-time computers.

According to HP, the Model A400 delivers more real-time computing power than its predecessor, the HP A600, at about 70% of the price.

The machine consists of an HP A400 processor chip, 512K bytes of random-access memory, an on-board I/O processor and four serial ports.

According to HP, the machine is aimed primarily at manufacturing applications, especially in the aerospace and telecommunications industries.

"The HP A400 is ideal for the manufacturing environment because it is a single-board minicomputer capable of controlling multiple devices and instruments," said James M. Burns, general manager of HP's data systems division. "At the same time, it is small enough to fit into intelligent equipment and tough enough to survive in harsh environments," he added.

The vendor claimed the A400 minicomputer can be used as a network data manager to monitor networks and diagnose and predict network problems in real-time. It can also take steps to maintain the system's health and integrity and can serve as a message router.

The HP A400 can be purchased as a board computer for $2,500; as a box computer in a Micro 14 six-slot package for $4,800, or as a Micro 24 14-slot package for $6,900.

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(Unretouched photo)

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Supercool chip revs up processor

ELMSFORD, N.Y. — A start-up company has developed what it claims to be the first commercial application for a processor based on Josephson junction technology, in which a chip is supercooled to 273 degrees below zero Celsius.

Hypres, Inc. recently demonstrated its PSP-1000 Picosecond Signal Processor, which the company said uses a liquid helium cooling scheme to support picosecond processing.

Hypres officials claimed that while the PSP-1000 is a test and measurement device, the Josephson junction technology has the potential to be used later in supercomputing, ultrahigh resolution radar and communications systems operating at frequencies in the 50-GHz to 1000-GHz range.

Hypres said the superconducting devices dissipate less power and generate less heat than conventional semiconducting devices, allowing chips to be packaged extremely densely.

Supercomputing vet

Hypres Chief Executive Officer Sadeg M Faris worked on a Josephson junction research team at IBM before that project was dropped in 1983 and said such superconducting technology could lead to computers with cycle times of 500 picoseconds.

Hypres said its PSP-1000 Picosecond Signal Processor will be available in June at a cost of $120,000.

Necessary input modules, which range in price from $20,000 to $45,000, will also be available for purchase with the PSP-1000.

IPL offers System/38 memory card

WALTHAM, Mass. — IPL Systems, Inc. has introduced a 4M-byte memory card for use in the IBM System/38 Model 700 minicomputer.

The product provides twice the storage capacity of IPL's previous add-in memory for the System/38.

IPL, which also manufactures midrange systems compatible with the IBM 4300 family, claimed a price advantage of 50% in comparison with IBM memory products. The 4M-byte IPL board costs $10,000. Two boards are necessary to carry out the 8M-byte minimum logical upgrade in a Model 700, an IPL official noted. The Model 700 was introduced as a high-end System/38 last year.

The company said several of the 4M-byte boards have been delivered to customers.

Optical archiving subsystem claims increased throughput, data integrity

BY ALAN J. RYAN
CW STAFF

PLACENTIA, Calif. — Tecex Corp. recently announced that it has upgraded its optical archiving subsystem to include direct-read-during-write (DRDW) technology.

The TEC-OAS/1 Subsystem, first shipped in October 1985, originally performed through direct-read-after-write (DRAW) technology, according to Mike Johnson, manager of Tecex's optical systems division.

The TEC-OAS/1 provides up to 7G bytes of on-line archived data, the vendor said, and works with the Digital Equipment Corp. VAX series of architectures, from the Q-bus Microvax II to the VAX 8650 processors.

The enhancement is integrated through a single-board Q-bus or Unibus host adapter without patches or changes to the existing DEC-based software device drivers or utility packages, the vendor said.

Because the DRDW technology involves a new drive, users of the subsystem with DRAW technology are unable to upgrade without purchasing the entire unit. "The trade-offs are negligible," Johnson said.

For new customers of the subsystem, which costs $21,000 for the Unibus version and $20,600 for the Q-bus version, the DRDW technology will reportedly help revolutionize error correction to provide 100% data integrity during real-time write operations, Johnson said.

Implementing DRDW reportedly increases throughput and eliminates unnecessary drive latencies during the write-and-verify process without making a rotation. Increased throughput performance during a sustained write operation is up to four times faster than previous product releases, according to the vendor.

Another reason the company has switched drives, Johnson said, is to help it migrate toward 5¼-in. optical-disk products. He said that Tecex will probably ship a 5¼-in. product early next year.

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Lab tests

CONTINUED FROM PAGE 57

Floating Point]," according to John Marte, the company's vice-president of marketing.

"What it was acquired for was to provide some research and development into the area of parallel processing," according to Bill Spack, associate leader of the computing and communications division at LANL."This computing division, as well as the Defense Advanced Research Projects Agency and the Department of Defense, have interest in parallel processing," Spack added.

Once delivered to LANL, the unit "came on very rapidly," Spack said. The only problem, he added, had to do with the amount of primary power in-house at LANL. "We still have the power limitation and have to increase the power to the building." Currently, "the whole thing is at the capacity of the power supply," and the users are only operating one part of the system at a time, according to Spack.

Norman Morse, division leader of the LANL Computing and Communications Division, said the Floating Point machine "is primarily a research vehicle for us. We probably will not run any production on it any time soon.

"Our expectation is that the T series of machines may be powerful enough to actually put at least a representative of a production code on the machine and get better experience with multitasking in a 128-processor environment," Morse added.

The T200 is the largest massively parallel supercomputer to be installed at LANL, Floating Point claimed, with 128 nodes — each with a peak performance of approximately 12 million floating-point operations per second (MFLOPS).

Recent benchmarks on the T200 achieved 1.16 GFLOPS on a two-dimensional convolution, with 2.6 billion operations performed; and 1.13 GFLOPS on a matrix multiply-and-add with 4.3 billion operations performed, with 64-bit precision, the vendor claimed. The benchmark performance was nearly five times the theoretical peak speed of a Cray Research, Inc. X-MP-1, according to Floating Point.

Morse said LANL will use the Floating Point operating system with the machine.

LANL is a multiprogram facility that develops, among other things, nuclear warheads. LANL also works in advanced nuclear reactor designs, environmental and safety areas, biomedical research and fusion and thermal energy. The laboratory is operated by the University of California for the Department of Energy.

The $6 million price tag includes the mainframe, its software, maintenance for one year, two on-site analysts and one engineer, Spack added.

Cray fends

CONTINUED FROM PAGE 57

oretical alternatives and challenges that Cray must answer.

Cray brought the price of its entry-level X-MP down to $2.5 million with a tuned-down X-MP that allows a customer to get into supercomputing for half the price of the earlier X-MPs. Cray did this while enhancing other parts of its product line, including the Cray-2. The X-MP/14SE appears to serve in a rear-guard capacity. In a market in which the user base is measured in quantities of 10 — market leader Cray can count on about 30 sales a year — convincing even a couple of customers to move into X-MPs rather than keep scientific applications on mainframes can be a major factor.

However, there is still one more challenge for Cray and ETA. They must deal with customers who want to do scientific computing on something faster than an IBM 4381 or Digital Equipment Corp. VAX without spending millions of dollars. Those customers are looking toward $100,000 near-supercomputers.

Cray and ETA may not want to move down into that price range, but the emergence of near-supercomputers raises the possibility those customers will move upward. That is when Cray and ETA must be ready with yet another solution.

Connolly is *Computerworld*'s senior editor, systems & peripherals.

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When it comes to more and more com

There are times when you need full uninterruptible power supply (UPS) protection for your computer.

And times you don't.

That may sound like heresy coming from the world's largest UPS manufacturer (in combination with our partner, Merlin Gerin). But there are many potential low-cost alternatives that you should be aware of.

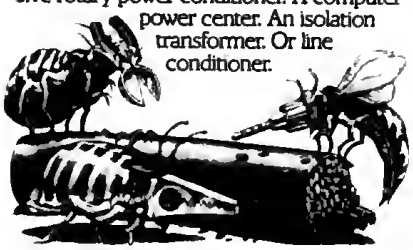
As Bell Labs reports in a major study of 24 computer sites, motor-generators solved 96 percent of their power line problems.

Full UPS with 15 minutes of battery reserve took care of only two percent more.

Don't let the culprits get you.

They can be transients, sags, glitches, surges and brownouts. Dirty power bugs that can lose data, crash heads, blow delicate circuitry and grind your operations to a halt.

Or they can be smoothies selling six-figure UPS systems because that's all they offer. When you may really need only an inexpensive rotary power conditioner. A computer power center. An isolation transformer. Or line conditioner.



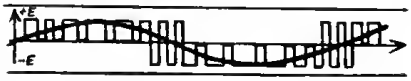
Get an objective opinion.

Make sure it's well-qualified, from someone with no ax to grind.

Only one computer power protection specialist has a complete product line from switchgear to transformers to motor-generator sets to full UPS systems, both static *and* rotary. Emergency Power Engineering, Inc. EPE, for short.

One-UPS-manship.

For solid-state believers, our new Ultimate Power Systems subsidiary offers static UPS systems ranging from 3 to 3000KVA in easy-to-install parallel modules. All utilize state-of-the-art pulse-width-modulation voltage regulation techniques for ten-times faster response to critical load changes.



Over 3000 of these systems are installed now world-wide.

If you haven't looked at rotary UPS lately, EPE systems will amaze you. They're the only UPS systems you can grow into. Just start with our Powerbloc motor-generator modules

NEW PRODUCTS

Processors

Microbar Systems, Inc. has announced a Multibus II Central Services Module called the **CSM-B**.

According to the vendor, each system must be equipped with a Central Services Module, which assigns logical addresses to each physical device on the bus during system start-up. The CSM-B is said to provide this function as well as others required of the Central Service Modules, as stated in the latest IEEE-P1296 specification.

The CSM-B is priced at $315 in quantity orders.

Microbar Systems, 785 Lucerne Drive, Sunnyvale, Calif. 94086.

Matrox Electronic Systems Ltd. has announced the **MG-1280** single-slot, color graphics processor board for the Multibus I architecture.

The board is said to enable the creation of 1,280- by 1,024-pixel graphics images at up to 35,000 vector/sec. The board can display 256 colors simultaneously from a palette of more than 16 million.

Other features include on-board, pipelined processors; a 16-bit direct memory access port; two RS-232 ports; and 2M bytes of on-board video random-access memory.

The MG-1280 is priced from $4,995.

Matrox Electronic Systems, 1055 St. Regis Blvd., Dorval, Quebec, Canada H9P 2T4.

Comtal/3M has announced the **Visionlab II-T**, a digital-image processing system.

The system is said to utilize a dual-bus design to deliver enhanced real-time image processing performance. The IBM Personal Computer AT-compatible bus controls interprocess communication, and the video bus provides direct memory access operations between the system's image processing boards. The image-transfer rate is up to 36 million pixel/sec.

Real-time processing commands include contrast enhancement, continuous zoom, minify and roam. Other commands include image edit, filtration and image analysis

Features include data compression, variable windowing, aspect-ration correction and input lookup tables for gamma or contrast correction.

The system is priced from $15,000

Comtal/3M, 1111 S. Arroyo Pkwy., Pasadena, Calif. 91105.

Data storage

Sigma Information Systems has announced its Digital Equipment Corp. LSI-11-compatible **SA-H123S** peripheral mounting enclosure.

The enclosure is said to provide mounting and power for two 8-in Fujitsu Ltd. Winchester disk drives. Each drive has its own 175W power supply, rear on/off switch and fan. Two additional fans provide cooling with side exhaust.

The SA-H123S is priced at $1,392.

Sigma Information Systems, 3401 E. La Palma Ave., Anaheim, Calif. 92806.

Terminals

Graphon Corp. has announced the **GO-400 series** of color-composite terminals.

The GO-400 terminals are said to use the Texas Instruments, Inc. TMS34010 graphics systems processor. They support various industry-standard interfaces, including Tektronix, Inc. 4100/4200 series and Digital Equipment Corp. VT220 graphics.

The GO-405 offers 16 pages of local alpha storage, a 4,096-color palette, one parallel and three serial ports and up to 52 lines of text on the screen. It costs $2,995.

Both the GO-407 and the GO-411 offer 22 pages of local alpha storage, up to 52 lines of text, 256 colors from a palette of 16 million, raster operators and local storage for two full 16-color graphics images. The GO-407 costs $3,795, and the GO-411 costs $5,995.

Graphon, 1901 S. Bascom Ave., Campbell, Calif. 95008

Barco Industries, Inc. has introduced the **CDCT 6000 series** of 19-in graphics display monitors.

The line includes four monitors with resolution up to 1,280 by 1,024 addressable pixels. The monitors have a red-green-blue bandwidth of up to 120 MHz and a range of horizontal scanning rates between 15 and 75 KHz.

Options for the CDCT 6000 monitors include rack mounting, an antireflective coating and a tilt-and-swivel mount.

Prices range from $3,100 to $4,900.

Barco Industries, Suite 212, 170 Knowles Drive, Los Gatos, Calif. 95030.

power protection panies get the shaft.

and simply grow UPS as you need it in affordable steps, complete with battery back-up.

We've caused a revolution in rotary.

No longer are motor-generator sets big rumbling cellar dwellers. EPE systems run cool so you save on air conditioning. They're small, highly reliable, cheap to maintain, handsome and quiet enough to blend right into your computer room.

They can ride through 96 percent of the power disturbances you're likely to face. And they're the only ones capable of totally isolating your computer from electrical noise.

90 percent of your problem may be already licked.

You may only need an add-on inverter and battery package that can transform your existing motor-generator sets into a complete off-line rotary UPS system.

Your savings could be enormous.

EPE has one business, one thrust.

Computer power protection. Distribution, conditioning, to full UPS. We got rolling in 1971 by consulting for others. Custom switchgear and patented loadbanks quickly followed.

Now, programmable, compatible EPE environmental systems (EMS) monitor your power status. We make our own isolation transformers. Computer power centers isolate, distribute and monitor AC power and provide critical systems grounds.

We have no ax to grind. No specific products to push. Just a burning desire to solve computer power problems the best way for you.

Our solutions are working so well, we've grown over 50 percent each year since 1980. Today, we have over a quarter-million sq. ft. of manufacturing facilities and employ over 500 people. We have happy customers in 90 percent of the FORTUNE 500 companies, an unbeatable technical staff and unmatched service that's close to you.

Attend a power seminar.

Get straight answers about power line disturbances from Warren Lewis, co-author of the Bureau of Standards "Guidebook on Electrical Power for ADP Installations" (FIPS 94), at a location near you. Or write for our power protection guidebook. Better still, visit us in Southern California.

epe

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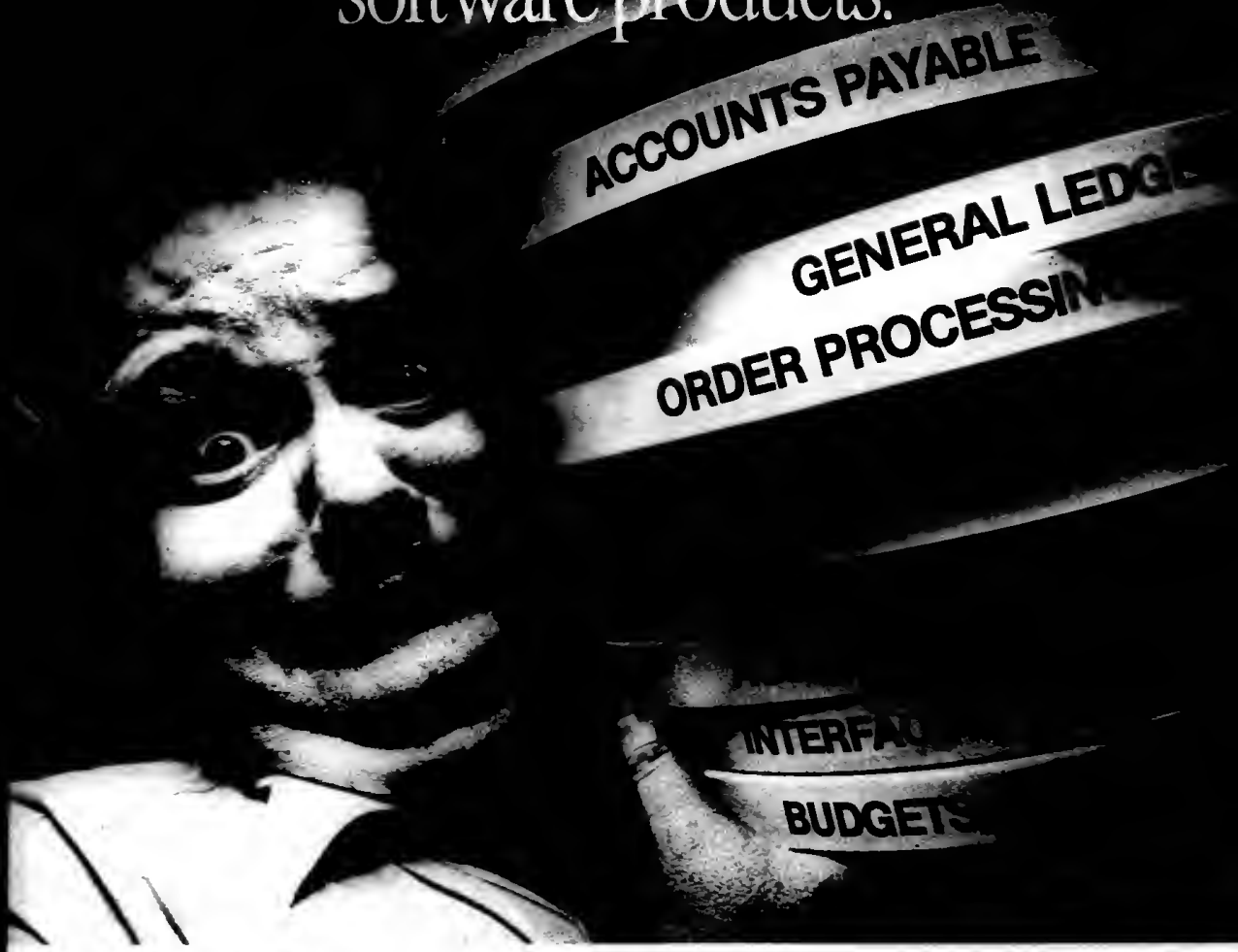
We don't make an exceptional number of mainframe software products.



Some large software companies aggressively sell the single vendor idea. Unfortunately, the benefits of using this approach can be far outweighed by inconsistent quality and poor integration across a multi-application product line. Opting for one vendor may force a user to settle for some second-class products that ride on the coattails of good ones.

Unlike many "single source" or "all-things-to-all-people" vendors, Data Design believes in doing one thing. And doing it well. We specialize in truly integrated mainframe financial software. Period.

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ACCOUNTS PAYABLE
PURCHASE ORDER CONTROL
FIXED ASSETS
PROJECT ACCOUNTING SYSTEM

consistent throughout our line of financial software. We believe that quality, reliability and integration shouldn't be *optional features* of a software system. They should be built in from the ground up.

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If you're in the market for mainframe financial software, we want you to consider the products that are considered the best: financial applications software by Data Design.

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Printers/Plotters

I-O Corp. has introduced the **I-O 8210 Procard**, a conversion kit for IBM Proprinters said to allow 80- and 132-col. printers to be used with IBM's System/34, 36 and 38.

The single personal computer card installs in the Proprinter. It emulates a 4214 printer on the System/36 and 38 and a 5224 or 5225 printer on the System/34. According to the vendor, the conversion kit allows for printing bar codes and graphics via IBM's advanced printer function.

The I/O 8210 Procard costs $795.

I-O, 2256 S. 3600 West, Salt Lake City, Utah 84119.

Power supplies

Sutton Designs, Inc. has introduced the **MM-Series** and **F-Series** uninterruptible power supply systems.

The MM-Series is offered in 250W to 1,000W sizes. The F-Series consists of continuous, on-line sine-wave systems and is offered in 3-kVA to 15-kVA sizes. Both series feature built-in extended range surge, spike and noise protection circuitry.

The F-Series systems include computerized, self-diagnostic monitoring and control package for monitoring all system modes, alarm conditions and 12 power parameters. It also creates an outage log.

The MM-Series is priced from $399 to $1,399. The F-Series is priced from $5,995 to $14,995.

Sutton Designs, 300 N. Tioga, Ithaca, N.Y. 14850.

Nova Electric, Inc. has announced a **three-phase 30-kVA**, on-line uninterruptible power system.

The 30-kVA system is said to employ transistor technology in a six-step wave-form design. It includes a static transfer switch and maintenance bypass switch. It also comes with a complete diagnostics package and battery backup. The power system was designed for data processing applications on systems such as IBM's System/38 and Digital Equipment Corp.'s VAX.

The 30-kVA power system is priced at $29,700.

Nova Electric, 263 Hillside Ave., Nutley, N.J. 07110.

Auxiliary equipment

Empire Data Protection, a division of Empire Safe Co., has introduced the **EMC-100** safe, one of the EMC series of safes.

The EMC-100 is said to provide protection against destruction and alteration of information stored on computer media resulting from fire, humidity, water, dust, magnetic disturbances and theft or espionage.

The EMC-100 is priced at $575.

Empire Data Protection, 433 Canal St., New York, N.Y. 10013.

Electro Standards Laboratory, Inc. has unveiled its **Model 8024-D Twin-Axial A, B Switch** for use at the twin-axial interface of the IBM System/34, 36 and 38; 5120, 5150 and 5520 systems; and others.

The product reportedly allows the user to switch any twin-axial port to either of two peripherals or to switch a terminal to either of two ports. The Model 8024-D costs $119.

Electro Standards, P.O. Box 9144, Providence, R.I. 02940.

Maintenance equipment

Micromax Corp. has announced the **Model 100**, a hand-held test set designed for off-line testing of both serial devices and parallel printers.

The Model 100 is said to feature a microprocessor that is controlled by an erasable programmable read-only memory-based program.

It costs $349.

Micromax, P.O. Box 438, Berlin, N.J. 08009.

Uptime

Software for Network Survival

Let LCON manage your MVS Complex
The Logical Console Operator's flexibility and rock steady reliability allow it to schedule and manage your tedious, complex, and repetitive console chores. Everyone wins with faster response time, increased batch throughput, improved on-line service and more uptime.

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The CICS Dump Display Facility gives your support staff instant on-line and hardcopy access to CICS transaction and system dumps. You may view and print any dump without disturbing CICS. CDDF archives your dumps for after-the-fact analysis. You may route dumps to remote locations.

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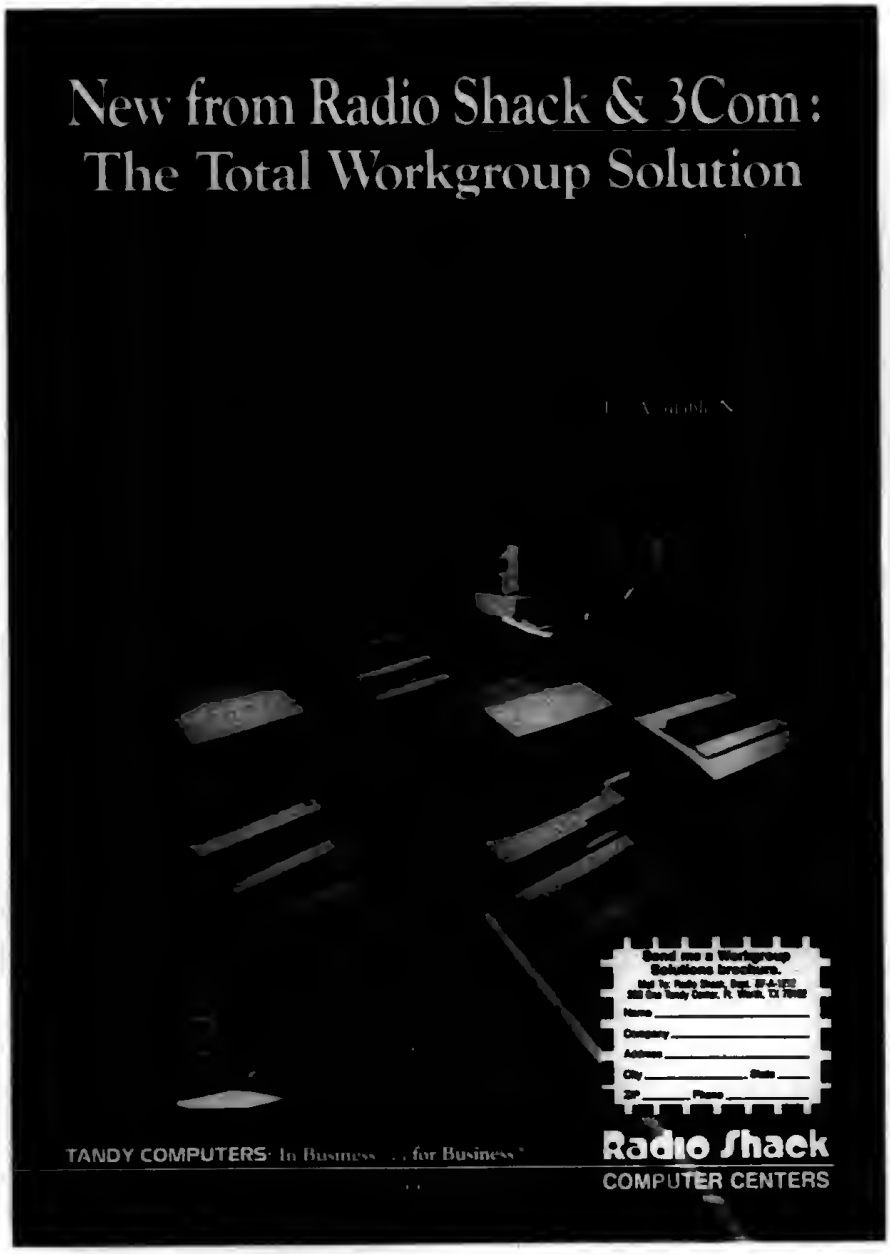


INTRODUCING FUJITSU'S DX [illegible]

TAKING PC PRODUCTIVITY TO NEW HEIGHTS

Choose the 80-column [illegible] column DX2200. For sheet pr[illegible] Fujitsu printers can't be topped. At [illegible] throughput is almost double [illegible] competitors.

The built-in bi-directional tractor [illegible] handling too. Just flick a switch to go from continuous forms to single-sheet feeding, without removing cumbersome optional tractors or tractor paper.

The well-designed operator panel gives you fast, convenient control of all printer functions, and enables you to identify error conditions quickly.

DX printers won't distract you from your work either—thanks to their quiet operation at less than 55 dBA.

And [illegible] DX printers produce [illegible]

less [illegible]

fo[illegible]

[illegible]

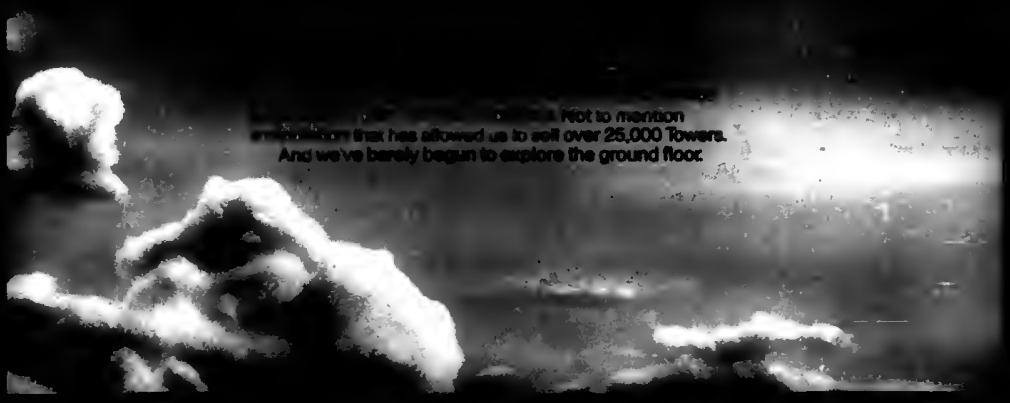
WE'RE [illegible]

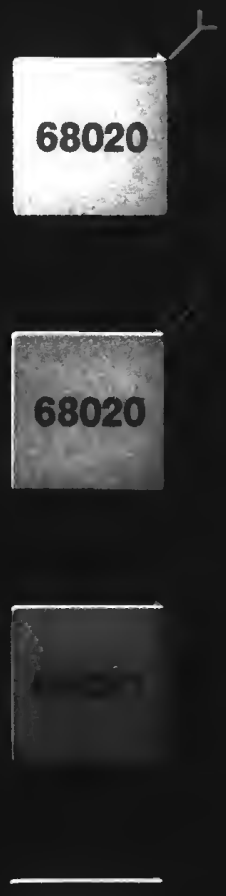
FUJITSU

FUJITSU AMERICA

SMART COMPANIES HAVE COME
TO EXPECT BIG THINGS FROM US.

NCR


Not to mention
that has allowed us to sell over 25,000 Towers.
And we've barely begun to explore the ground floor.


68020
68020

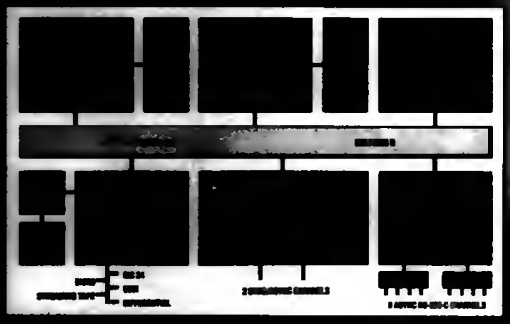
OWER TO ADD PROCESSORS. AND WHERE YOU NEED THEM.

of the NCR Tower 32/800 is an architectural of colossal proportions. A loosely-coupled, architecture that lives up to the powers of our distributed UNIX. an ingeniously logical idea. on one central processor to do more by itself, the Tower 32/800 off-loads processing to intelligent 68000-series to their own specific tasks. disk cache, and manages traffic. The terminal processor terminals you hook up. The provides control for And the Ethernet LAN network traffic.

Which frees the appli- to do run applications the workload among the other processors.

All of them work independently and in parallel. Communicating over Multibus II sending

an



LAR DESIGN
BUSINESS SENSE.

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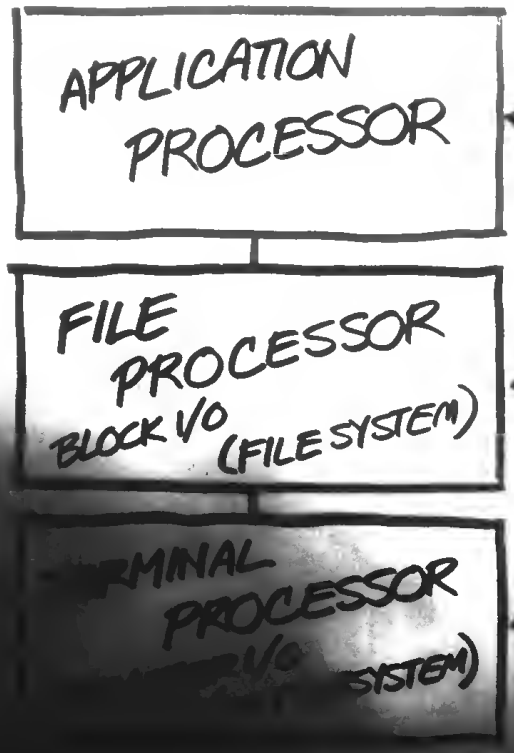

APPLICATION PROCESSOR
FILE PROCESSOR
BLOCK I/O (FILE SYSTEM)
PROCESSOR
SYSTEM)

A DISTRIBUTED UNIX TO MAKE THE WHOLE BUSINESS WORK TOGETHER.

To build a true incremental, multiprocessor Tower, we had to do more than dream up a whole new kind of architecture.

To control such a system, we needed an operating system that would unlock the inherent "parallelism" and multi-tasking/multi-user potential of UNIX in a way no one had ever done.

Of course, the NCR-enhanced UNIX System V.2 (SVID) we began with was no slouch. We've been refining and improving UNIX for over 5 years. We added simplified, plain English interfaces. Automatic power failure recovery.* Consistent error-logging. Remote and in-service diagnostics. Record and file locking. Support for all major industry-standard protocols, including Ethernet, SNA and 3270 bisync. Demand-paging memory management. And more.

But we went a step further.

We split apart the UNIX kernel. And distributed UNIX intelligence onto powerful processors dedicated to applications, file, terminal and communications processing. Giving each the ability to work independently and in parallel. Synchronizing and balancing the processing workload efficiently. Off-loading I/O from the applications processor. And increasing throughput dramatically.

So you can run more programs and support more users on a Tower 32/800 than you could with a conventional uniprocessor UNIX system.

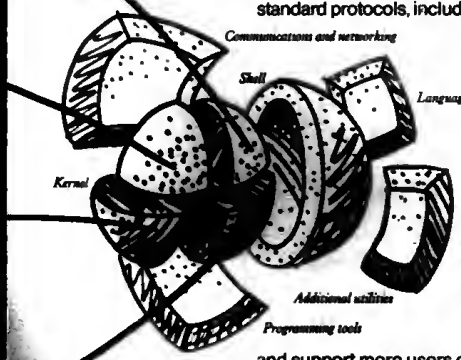
The neatest trick of all is that these modifications are invisible to users. And it's compatible with existing versions of UNIX.

The improvement in performance, however, is very visible.

Of course, high performance wasn't our only high priority. We set out with a vengeance to make our sophisticated architecture a snap to manage.

The Tower 32/800's Visual System Administrator program [illegible] the less experienced user plain English menus to [illegible]. While the experienced UNIX guru can enter [illegible] his or her own blistering pace.

[illegible] Tower 32/800 with distributed UNIX. [illegible] than the sum of its parts.



To control the revolutionary multiprocessor architecture, we distributed the UNIX kernel. Putting intelligence on every board.

[illegible] ALL, IT'S A TOWER.

You've met the new NCR Tower 32/800.

But let's not forget its only the [illegible] of geniuses.

Any resemblance between [illegible] ional: NCR-enhanced UNIX. Open sy[illegible] work with industry standard hardware [illegible] reliability. And much, much more.

Because Towers are upwardly co[illegible] can grow from the 68010-based MiniTower (1-8 u[illegible] (1-16 users), up to the 68020-powered [illegible] Tower 32/400 (1-16 users) to the NCR [illegible] users) to the NCR Tower 32/800 (32-128 users).

[illegible] building your business around the Towers [illegible] of a solid, $4.9 billion corporation behind [illegible] one of the world's largest service [illegible] service lets us solve 70% of your problems over [illegible] Our network of over 20,000 service personnel [illegible] field locations means help is only min[illegible] then a quarter of a bil[illegible] many computer [illegible], you [illegible]

NCR

WHAT'S INSIDE OUR TALLEST TOWER.

MULTIPLE LOOSELY-COUPLED PROCESSORS

Processor type	On-board processors	Memory	Max Processors
Application	(1) 68020	4MB-16MB RAM	4
File	(2) 68010	1MB RAM*	4
Terminal	(2) 68010	1MB RAM*	16
Communication	(1) 68010 (1) 8085	1MB RAM*	4
Local Area Network	(1) 68010 (1) 80186	1MB RAM*	1

*Memory resident on-board for UNIX code not user programmable

USERS
1-128 local or remote connections (Up to 256 connections in planned releases)

MEMORY
4-16MB per Application Processor
Total 64MB with parity checking error correction and power failure recovery

MASS STORAGE

Flex Disk Min/Max	1MB Flex
Fixed Disk Min/Max	170MB to over 6GB
Tape Cartridge	5 25 45MB
Mag Tape Reel	Yes (1 to 3)

OPERATING SYSTEM & SOFTWARE
NCR-enhanced distributed operating system derived from UNIX User-friendly menus and programming aids Multiple database options

LANGUAGES
C COBOL BASIC FORTRAN PASCAL

INDUSTRY STANDARD INTERFACES
I/O Bus
Multibus II
Magnetic Media
ESDI 5 25" Winchesters
SCSI—Small Computer System Interface (8" and 9)
QIC-II—Streaming Tape

COMMUNICATIONS/NETWORKING
RS-232-C (ASCII TTY)
2780/3780 Remote Batch System
3270 Binary Synchronous Emulation
SNA/SDLC (3270 RJE LU 6 2/2 1)
X 21/X 25 HDLC
TOWERNET (ETHERNET)
TOKEN RING (In planned releases)

POWER BACKUP UNIT (OPTIONAL)
Recovers from power failure of any duration Immediate recovery from failures of less than 10 seconds

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SP-3197

EXECUTIVE REPORT

TECHNOLOGY IN BANKING

Technology in banking: Who is cashing in?

BY GLENN RIFKIN

"For 30 years, bankers lived by the three-four-three rule," consultant David Gilbert says. "Borrow at 3%, loan at 4% and go home at three o'clock. But now banking has been redefined, and the walls are coming down."

As the banking industry awakens to the competitive realities of deregulation, the idea of banker's hours has radically changed: It means 24 hours per day following the sun — as it shines on the world's financial markets. The key to competing in this new environment, according to Gilbert, president of Banking Decisions Systems, Inc., a Waltham, Mass., consulting firm, is the effective and timely implementation of technology. And right now, Gilbert insists, except for a few organizations, banks are missing the technology boat.

"The transition from an environment of regulation and stability to one of deregulation and instability has shown that information systems put in place before deregulation are simply not able to handle the change," Gilbert says. "It's shocking how much banks don't know."

Although the top-tier banks such as Citibank, N.A., Bankamerica Corp., Chase Manhattan Bank, N.A., Mellon Bank, Banker's Trust Co. and Banc One Corp. have poured resources into leading-edge banking systems, bankers and consultants agree that the vast majority of the country's banks are not technically prepared for today's marketplace.

Major concerns include the following:

- Banks that invested heavily in "back-shop" automation are not able to use those automated accounting systems to provide the management information needed to gain a competitive advantage.
- Integrated software application packages designed to provide "a bank in a box" have not fulfilled their early promise and have left MIS executives wary and cautious about this solution.
- Electronic transaction systems for applications such as direct deposit are seeing only limited use, and banks, content with an inexpensive checking system, are not pushing this technology.
- As regional and interstate barriers come tumbling down, banks must find better methods for data communications by consolidating individual networks to improve branch banking beyond the automated teller machine and platform teller applications.
- Deregulation means greater decentralization for banks and puts an emphasis on smaller distributed systems and networks that provide for more effective branch banking.
- Global banking is now infringing on markets long held by U.S. banks, thus challenging the banking industry with potential problems similar to those that have struck manufacturing.
- MIS executives in banks must continuously push senior management to understand the use of information systems as a strategic weapon.
- With deregulation and technology combining forces, the big banks grow larger and more menacing while the country's second-tier banks struggle to survive in a newly competitive marketplace.

Rifkin is a senior editor for *Computerworld*.

CHRISTIAN SPRUCE

INSIDE

High tech aids a troubled Bankamerica
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Interview: Banc One exec on change
PAGE 69

Are banks on track with expert systems?
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Branch automation fuels technology fire
PAGE 76

The verdict please

And the results are already coming in. Mergers and acquisitions abound as the superregionals and giant national banks swallow the smaller banks. International banking and financial firms are making inroads into the U.S. market and taking market share from regional and local banks.

According to William Synnott, director of information systems and services at Bank of Boston Corp., complete deregulation of interstate banking in the next five to seven years will cause the number of banks in the U.S. to shrink from the current 15,000 to just a few thousand in the 1990s. "As we are able to cross state boundaries, the facilitator is going to be electronic banking, not bricks and mortar," Synnott says.

Meanwhile, the promise of the bank of tomorrow remains unfulfilled. The banking industry pioneered the use of mainframe computing for number-crunching in the 1950s and invested heavily in accounting systems throughout the '60s and '70s. The emphasis, however, was squarely on the labor-intensive productivity-enhancing capabilities that reduced costs.

This automation of the back shop, ironically, is partly to blame for today's shortcomings.

According to Phil Giaquinto, senior vice-president for global

Cashing in

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electronic banking at Chase Manhattan Bank, the early commitment to commercial DP equipment allowed banks to be leapfrogged by a generation of technology. "Banks installed automated accounting systems so early, before such things as data base management systems existed, that it has not been an easy task to take advantage of new hardware and new software," he says. "By being a pioneer into technology, banking lost a chance to easily implement new systems."

Although many top-tier banks have made the transition to modern technology, there are a lot of banks still using 10- to 15-year-old systems, and the evolution for them will be more difficult.

"It's only in recent years that we've begun to look at technology as a revenue generator rather than as a cost-cutter," Synnott adds. "And there are still a lot of managers who have the old view and just haven't gotten the vision of how systems can be used competitively."

Futurists who, in the 1960s, predicted a checkless and cashless society have been proven dramatically wrong. And more recent predictions have also come up short: According to Osman Eralp, senior technical analyst with Hambrecht & Quist in New York, the deregulation fever of the early 1980s was flush with visions of full-service banks with sophisticated products ready for eager customers. Customers could expect discount brokerage services, travel services, financial planning and such innovations as home banking, point-of-sale services at stores and other offerings not usually associated with banks.

Unfortunately, the hype was not met with much enthusiasm or support. "Consumers got smart," Eralp explains. "That's not what you go to a bank for. You go to a bank to borrow money or to keep your money safe."

"There is a point where you can't push customer acceptance anymore," adds Arthur Gillis, a banking consultant based in New Orleans.

The role of MIS

If banks and their customers are, in fact, not getting as much from today's technology as they could or should be, the obvious question is: Who is to blame? Does the responsibility fall on MIS?

Gilbert says he believes that technology is a partnership issue. "It is far too easy to blame MIS," he states. "MIS needs the input and direction of executive management. Management must effectively communicate the needs the bank is going to have both strategically and tactically."

In this marketing-oriented environment dictated by flourishing customer service needs, MIS needs not only to implement systems but to be able to visualize market opportunity. Senior management needs to work with MIS to understand the technical possibilities.

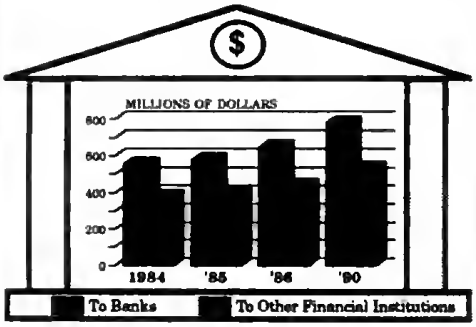
At Texas Commerce Bank-Houston, N.A., the fourth largest bank in Texas, Ben Kuenemann, executive vice-president and group manager for technology marketing, insists that it is MIS's job to sell the benefits of information systems to management. "Management is not aware of the potential of automation," he says. "It's difficult for management to accept the old 'trust-me' approach from MIS. MIS can't hide behind the mystery of our business — that causes executives not to trust us. If we can't talk to them in language they can understand, then we're not doing our jobs."

MIS executives and banking consultants agree that education

Continued on next page

Shipments of large-scale processors to financial services institutions

As banks turn toward distributed processing, the need for large-scale systems will grow slowly



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Troubled Bankamerica looks to technology for financial relief

Nation's second largest bank stocks its arsenal with information systems

Bankamerica Corp., the troubled San Francisco-based banking giant, is fighting an uphill battle to regain its lost luster.

Saddled with billions of dollars' worth of bad loans and problem assets, the nation's second largest bank lost more than $800 million in 1985 and 1986 combined. As if that wasn't enough, Bankamerica just emerged from a trying takeover struggle with First Interstate Bancorp of Los Angeles — a skirmish that for now, at least, has left Bankamerica independent but vulnerable.

Despite its woes, the bank does have a strategic weapon left in its arsenal: information technology. During its rise to prominence, Bankamerica quickly recognized the importance of information systems and spent billions on equipment and research and development in the early 1980s.

Although it pulled back dramatically in some technology areas during its recent troubles and saw info systems whiz Max Hopper leave in late 1985 to return to American Airlines, Bankamerica has a solid technology foundation in place.

According to Bob James, a financial services industry expert and a senior consultant at Menlo Park, Calif.-based SRI International, Inc.'s Center for Information Technology, Bankamerica continues to enjoy a reputation of being on the leading edge in the adoption of technology. In fact, he points out that the bank has more technology in place than it can effectively use.

"Even before Max Hopper joined them, the bank was spending heavily on technology," James says. "And though they've scaled back, the infrastructure is a very prime asset of the bank; in a sense, it is an undervalued asset. It makes Bankamerica strong in terms of future capabilities, if they can turn the loan portfolio situation around."

James points out that the technology base at Bankamerica is stronger and more sound than at most other banks in the country. Although Hopper took a few key employees with him when he left and though personnel cuts cost MIS as well as other areas of the bank, the MIS staff retains high-quality professionals, James says.

In addition, the very size of Bankamerica — a bank with more than $100 billion in assets — affords it an economy of scale in per-unit cost that most banks cannot match when it comes to transaction-level systems.

In retail and consumer banking, the bulk of technology is devoted to automated teller machines, platform teller systems and other large transaction systems.

Since these require "large iron and massive communications," the larger banks enjoy a greater economy of scale than second-tier banks, James says. He says he does not, however, believe the technology base will be a major factor in Bankamerica's turnaround. "How a bank manages its non-interest-bearing expenses such as DP is a good measure of how effective that bank is running," James says. "But technology per se does not impact the bank in the same way as managing its loan portfolio. The major business of a bank is borrowing and lending money, and it is loan losses that get a bank in trouble. No bank has gone broke by spending too much on technology."

> "TECHNOLOGY per se does not impact the bank in the same way as managing its loan portfolio. The major business of a bank is borrowing and lending money, and losses get a bank in trouble. No bank has gone broke by spending too much on technology."
>
> BOB JAMES
> SRI INTERNATIONAL, INC.

Pro-technology stance

Bankamerica is publicly taking a strong pro-technology stance. Although Lou Mertes, executive vice-president of Bankamerica systems engineering, was unavailable for comment, a bank spokeswoman says that Mertes and the bank believe that technology and its application "are absolutely critical to the bank as a way to help cut costs and generate revenue. The organization is strongly focused on specific projects to help the business units meet their goals through the use of technology."

The bank will not reveal current budget figures, but the estimated $5 billion designated for a five-year strategic business plan in early 1985 has no doubt been significantly reduced in these troubled times. Reports that the bank is centralizing its computer operations due to its problems are inaccurate, the spokeswoman insists.

All technology units and data centers — except for a few application areas within divisions — were organized under Bankamerica Systems Engineering (Base) in 1985, she says, and in early 1986 those application units were brought in to Base according to the original plan and not because of to financial problems.

Scaling back

Like several other large banks, Bankamerica mistakenly anticipated rapid growth in such areas as point-of-sale and interstate banking, neither of which has developed at nearly the rate that strategic planners predicted. Much of the reduction that Bankamerica has had to undertake in its DP arena is likely related to earlier overspending in these unfulfilled technologies. "The major portion of areas scaled back in DP don't relate to key day-to-day operations," James maintains. "They've cut back in R&D spending that may only have future payout."

As Bankamerica attempts to regain operating profitability and cut its retail bank expense rates, it can rely on a foundation of information systems that should make the task less formidable. Having already made its major investment in technology, it should, through the existing systems base, bring in the new applications necessary to manage the loan portfolio without additional spending, according to James. "Another bank without that base would be facing major investments to bring about a turnaround," he says.

James adds that Bankamerica can easily keep up with shifts in banking technology by investing in integrated software packages and other leading-edge offerings. "They are not shorting themselves on those things. Bringing in another IBM 3090-200 is just a blip for a bank as large as Bankamerica."

In the long run, technology will be a factor in Bankamerica's turnaround attempt, but good solid banking remains the key. "Technology in and of itself simply does not have nearly the leverage that effective management of the loan portfolio does," James points out.

GLENN RIFKIN

Cashing in

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is a more important factor than the systems themselves and that throwing technology at a problem will not solve anything. "We spent a lot of time trying to educate senior management as to how technology can impact the bank positively," Synnott says. "We now have a management that is enlightened to the point where they believe that technology can be a potent force. What they lack is the knowledge of how to bring that about. There has to be a lot of contact between the top systems people and the business managers."

In a time of great flux due to deregulation, a problem that many bankers face is simply articulating their needs to MIS. Consultant Gillis often finds that bankers don't know what they want or need. "There is a tendency to think that a magic black box will solve all the problems," Gillis says. "Because of this, the MIS guy needs to become more of a businessman."

Not all banks are willing to make the MIS executive a member of the planning team. "You have to communicate with management that there is a need to understand where the bank is heading strategically," Kuenemann says. "If you are turned down, you should pack your bags because you are probably topped out at that bank."

Coping with size, change

Synnott insists that one major obstacle for MIS is stabilizing the basic systems structure in order to move forward. As the business grows and changes, however, that becomes difficult. "Things move so fast that you never seem to be able to get past the day-to-day job of keeping the system running," he explains. "No sooner do you think you have a fairly stable environment than the bank goes out and acquires another bank, and you've inherited all their systems and data processing, which has to be absorbed in some fashion."

Another basic problem for MIS lies in the size of the bank. The nation's largest banks, like Bankamerica, have all made sizable investments in technology (see story page 66). As the barriers to interstate banking fall, market share will no longer be determined by state but by national holdings. But the majority of the country's commercial banks and thrifts are small, local operations hoping to avoid takeover or mergers with the onrushing wave of giant bank holding companies or superregional banking conglomerates.

For these small banks, the use of information systems may be limited. "What's good for Citibank may not be good for a smaller bank," Eralp says. Many have already turned to service bureaus for their DP needs. For large banks with assets of more than $1 billion, better information can always improve the business decision processes, but for smaller banks, the options may be limited. Service bureaus provide an alternative but generally leverage their approach by running common systems across a large number of banks, thus leaving little competitive advantage for each individual bank.

As in any industry, banking's technology problems vary according to bank size, location and business focus. Bank of Boston, for example, is the largest bank in New England with $34 billion in assets, and Synnott says he believes it is unfair to characterize the bank as a single entity when discussing technology. The bank, he says, is actually a collection of five businesses including retail, wholesale, international, real estate and treasury and investment banking.

"There are businesses within the bank that have gained more of a competitive advantage with technology than others," Synnott explains. "There are certain businesses that are technology driven, supported by what I call 'super systems.' For example a stock transfer in a business is largely a matter of tracking the issuance and cancellation of shares. It is a heavily technology-driven kind of business. Those that have had the best systems seem to have captured the business. There are in fact, only five major banks in the U.S. holding 60% of that market."

At Bank of Boston the

Continued on page 70

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Interview

Blazing banking trails

John Fisher is the force behind Banc One Corp.'s drive into technology. Since 1960, the senior vice-president has been a proponent of leading-edge information systems, making Banc One a clear-cut winner in marrying banking with technology.

John Fisher recently spoke with *Computerworld* Senior Editor Glenn Rifkin.

What do you think of the charge that banks are not employing technology effectively enough to gain a strategic advantage?
Some of the criticism is valid, based mostly on the false starts of major software vendors such as Hogan Systems, Inc. and Anacomp, Inc. — companies that held out great promise of being able to deliver the integrated processing capability that we need. That that type of software system was not born was more a criticism of the software industry than of banking.

Now it looks like the Hogan product will be delivered as promised more than a half decade ago, and we and Norwest Corp. have joined with Electronic Data Systems Corp. to bring to the market the kind of system that we thought we were going to have all along.

Doesn't banking have to take some of the blame?
Sure. We probably created much of the downfall of Anacomp and the difficulties with Hogan and others simply because we were so damn demanding, not knowing some of the preciseness we wanted in the future processing systems. But we don't have today what we hoped to have had five years ago. So we are having to go back in and restart. It's held up branch automation to a major degree. But I think the industry is now moving toward more advanced integrated processing capability and on-line information retrieval capability.

Some say that banking is a slow, conservative environment. Has this hurt its use of technology?
I think that's bull. The industry is conservative, but I don't think it's regressive, if that's what that criticism suggests.

Banking is conservative in its management, mostly because of the product that it provides. It deals in people's livelihoods and their futures, and so it requires a certain conservative approach as opposed to what a retailer would have to do, as an example.

But I don't think banking can be relegated as a regressive, noninnovative industry. We have been one of the early leaders in urging and formulating DP requirements.

Banc One invests heavily in research and development for information systems. What do you get out of being a pioneer?
There is the learning experience, which allows you to employ what you've learned more efficiently or quickly than your competitor. So there's that direct expectation. But then there are some collateral benefits, which I think are even greater than the direct benefits. The collateral ones have to do with the prominence that you are able to establish for yourself and thereby attract talent.

There's also a notoriety within the investment community. How do you get a financial analyst from New York to pay attention to what the hell is going on out here in Columbus, Ohio? You have to be able to wiggle your ears. P. T. Barnum used that phrase when talking about being able to draw attention to yourself. One of the collateral benefits of what we've done and what we do is to wiggle our ears.

What do you spend on R&D?
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Was that a difficult sell to bank management?
As a matter of fact, the energy for R&D got under way in the mid-'60s, so we have a long-standing track record of believing that this is the proper way to give the forward tilt to our organization. The R&D expenditures developed were mostly due to the early leadership we gave to the credit card. We started that business in 1966. And we were able to build a business plan that allowed us to move into the data processing of credit cards for other banks.

Does MIS have to champion this entire effort?
I don't know that it is an MIS guy that we are talking about here. I think it's senior management. The R&D marketer, or wherever the champion for R&D is located, ought to have the ear of senior management. It is senior management that is concerned about the direction of the organization. So senior management is the director of R&D as I look at it, not the MIS guy.

John Fisher, *senior vice-president, Banc One Corp.*

Now they may be one and the same, or R&D may be championed by MIS. But it's more likely to be on the marketing side, because the marketer is the guy who is trying to figure out where the market is: "Where is it headed? What can I expect them to want of me? What are the products I can deliver?" And that's mostly research, development, exploration, innovation.

You are a big proponent of the all-purpose debit card, but that does not seem to have caught on as once anticipated. Why not?
The all-purpose debit clearly has not been brought to the market. Today we have a separate automated teller machine debit identification mark and systems represented mostly by the regional switches and by Cirrus Plus.

My expectation is that we should have built an all-purpose debit service competing with the check and provided as a companion to today's credit card an all-purpose credit system. I think that's how it will evolve.

You've said banks are not just handling transactions, they're selling services. Is this what banking has become?
Our history in banking has been to efficiently handle transactions, and that's how we've won the right to provide the demand deposit service. That's been the principal core product of banking. But that product has no exclusivity now — savings and loans, credit unions, insurance companies — all kinds of people can provide that kind of service. Therefore it is no longer the unique bank franchise it was.

So banks have had to find other ways to generate revenue. And it is the sale of other services that the banking industry is now struggling to do. We have trust, travel and brokerage services — peripheral products being delivered aggressively in what used to be only a transaction environment, a bank lobby.

The emphasis in the past has always been on the teller. But that's changed now. The sales force is able to sell individual retirement accounts, mutual funds, money markets, investment counseling — products of the future — while retaining the importance of the transaction. •

Cashing in

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commercial finance business has prospered due to technology. Both effective credit management and record-keeping management systems allow the bank to make a profit and grow in a business that has been a losing proposition for many other banks. "Others don't have the economy of scale or the system to support it," Synnott says.

Synnott also points out that possessing the technology does not always ensure an advantage. In the area of cash management systems, for example, virtually everyone has jumped on the bandwagon, so even the early leaders are now hard-pressed to gain any advantage in that market.

"It is significantly more difficult to come up with a product in commercial finance or stock transfer. It requires a much larger investment over a long period of time. The key is to find something to make you unique and different while at the same time giving you the lowest cost product that the competition can't quickly match," Synnott states.

Integrated software packages

The early '80s brought promises of innovative integrated software application packages from such companies as Hogan Systems, Inc. and Anacomp, Inc. While Anacomp simply could not deliver, Hogan's Umbrella offering was cost- and labor-intensive, and the company offered no service or support for its complex product.

Faced with implementation schedules that often spanned five years, many banks turned angrily to Hogan seeking help, and the company, unable to answer the call, stumbled badly.

"I suspect that clients who bought the Hogan product seven years ago probably had a rough time installing it," admits Richard Aldridge, Hogan's executive vice-president of field operations. "If there'a one indictment of Hogan now that is justified, it's that the product is so flexible that, in many cases, banks can't handle it. That is because the banks don't know how they do their own business, and they can't be asked to make all these decisions. We are trying to tighten down and deliver a more complete product, like a 'bank in a box' concept."

Although Hogan has since recovered and is briskly selling its products through an agreement with IBM, the promise of the integrated package remains unmet in many bankers' minds. And having been burned once, they are reluctant to try again. Others believe the perfect integrated package simply does not yet exist (see chart page 74).

"Integrated packages have never quite made it," Synnott says. "There is a big push to do it, and there's a big market for it. The biggest obstacle is that there ia no single package available that is totally done and ready. And to scrap everything you've got and convert to a whole new system that is not all there is not an easy task."

Undaunted, a spate of software companies have leapt into this market. Vendors such as Hogan, Uccel Corp., Software Alliance Corp., Florida Software Services,

"IT IS the rare bank that acknowledges that investing in information is investing in a valuable asset."

DAVID GILBERT
BANKING DECISIONS SYSTEMS

Inc., Systematics, Inc. and soon Cullinet Software, Inc. and Electronic Data Systems Corp. (EDS) predict much promise in this area. According to research firm International Data Corp., this market will reach $1.4 billion by 1990 (see chart page 79).

EDS has jumped in by signing up such innovative banking companies as Banc One and Norwest Corp. to help create its integrated software product. "Our role in the venture is to identify how processes and procedures work within the bank," says John Fisher, senior vice-president at Banc One. "Once these procedures have been flowcharted, models can be built, and then software can be specified and coded as a result of that modeling." Fisher points out that Banc One has long been a Hogan bank but never got what it wanted from Hogan and decided to help build its own packages.

"The market is definitely there," says Steve Dark, vice-president of sales and marketing for Software Alliance in Berkeley, Calif. "EDS and Banc One wouldn't be in there if there wasn't a viable payback. Integrated packages will give the banks what they need, but we must set a reasonable level of expectation. The

Continued on page 74

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Can AI vault into banking industry?

BY BILL MARTORELLI
and JOHN HOSKINS

Without high technology, the face of modern banking would be unrecognizable. And because of the industry's historical dependence on computers, it seems logical that banks would be among the first to exploit the strategic potential of artificial intelligence and its most popular subcategory, expert systems — computer programs that duplicate human problem-solving techniques.

Over the long haul, banking will be one of the industries that will benefit most from this technology, as long as the needs of bank developers are met by tool vendors and expert systems application vendors.

Today, however, the promise is only just beginning to be realized.

Why is the industry lagging in its expert systems exploration? Partly because of the conservatism of banking. The perceived immaturity of the technology has prevented some cautious banks from taking the plunge.

Most banks, like many companies, have been unwilling to make a large investment in AI if a clear and thorough payback cannot be foreseen. The technology is of interest, but even banking MIS pros who have developed their own expert systems have had trouble justifying them on the basis of return on investment.

Economic justification for those banks just now delving into the area will be exceedingly hard to come by. The development of adequate return-on-investment measures for expert systems will be important for the future exploitation of the technology.

Trends hard and soft

The data processing environment in banking is dominated by systems from large vendors like IBM and Digital Equipment Corp. Bankers are often not highly receptive to special-purpose hardware and AI languages, which they perceive as exotic.

Instead, they are eager to embrace tools that run on familiar equipment, including IBM mainframes, the DEC VAX and the IBM Personal Computer.

A variety of AI delivery options within the conventional computing environments has begun to emerge. However, the use of high-end tools that require special training or experience with LISP — a widely used AI programming language — will likely be examined carefully by banking MIS professionals before being implemented.

Personal computers are of particular interest to MIS for low-cost investigation of expert systems and for the development of small applications that can be completed quickly. But the major role of the PC within banking AI will be as a delivery vehicle, and its role will accelerate with the emergence of Intel Corp. 80386-based microcomputers.

There is considerable ambivalence among bankers about the desirability of prepackaged expert systems applications. Many of the largest banks do not seem interested in purchasing these packaged applications at all, but instead choose to develop their own.

First Chicago Corp., for example, has been working on an expert system with an asset-based lending application.

Smaller banks, on the other hand, appear more willing to consider prepackaged systems, provided the products can be tailored to the banks' specific needs.

The requirement of customization should pose little difficulty, because many expert systems applications are sold as kits, to which a user must add specialized problem-solving techniques. The market for such

Martorelli is a senior analyst and Hoskins is a research analyst at New Science Associates, Inc., a South Norwalk, Conn., consulting firm specializing in emerging technologies.

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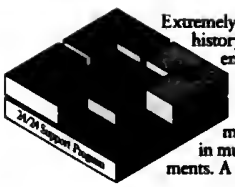

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systems is potentially very large, but burdensome financial, developmental and maintenance challenges await vendors seeking to compete in this market.

Even so, several companies are now offering prepackaged expert systems solutions for the banking industry, including Syntelligence, Inc. in Sunnyvale, Calif., which markets the Lending Advisor. Both Wells Fargo Bank, N.A. in San Francisco and First Wachovia Corp. in Winston-Salem, N.C., have joined Syntelligence as development partners in banking expert systems. Another vendor, Cogensys of La Jolla, Calif., is developing its own lending package, but its effort is only now coming out of the laboratory.

Two companies are marketing expert systems applications that attempt to format telex funds-transfer messages between banks. The majority of such traffic is now handled by a network, the Society for Worldwide Interbank Financial Telecommunications, better known as SWIFT, which requires that transactions be formatted for transmission in a certain fashion. The process of reading, understanding and formatting such messages is labor-intensive and time-consuming.

Cognitive Systems, Inc. in New Haven, Conn., has developed the Automatic Funds Transfer System — Atrans — which operates on DEC VAX hardware and seeks to reduce the need for telex operators and to increase accuracy. Atrans has been up and running since July 1986 at Citibank, N.A. in New York. More recently, Cognitive has been joined in the market by Citibank Information Resources, another unit of Citicorp, which is marketing a similarly positioned product called the Intelligent Banking Workstation.

MIS in the banking industry is concerned with two broad classes of expert systems applications — those targeted at key business functions and those oriented toward the data center. Trading as an application for expert systems is of particular interest as a way to augment — not replace — a trader's performance, thereby making a potentially vast contribution to profitability. Knowledge-based trading setups will serve as decision support systems with the capability not only to recommend a course of action, but to explain the reasons behind it.

Similarly, knowledge-based portfolio management systems hold the potential of improving the human portfolio manager's ability to maximize a bank's holdings of various investment vehicles. And Cognitive Systems has developed Courtier, a stock portfolio management advisory system, for Societe de Generale de Banque in Brussels. The product is designed to give information and advice to bank customers using a natural language interface in combination with the expert system.

There is also strong interest in applying expert systems to maximize the performance of the data centers and communications networks that are so crucial to modern banking. Applications such as network control and optimization and data center automation and operations support are already under development at some banks and will be increasingly common in years to come.

So which banks are taking the first steps? What is the future of expert systems in banking? While a few examples are evident, it is hard to gauge the technology's industrywide acceptance. A tight cloak of secrecy envelops the expert systems activities of most banks, underscoring the perceived strategic value of the technology and the hotly competitive nature of the industry as well as banking's general unfamiliarity with expert systems. With more experience, banks will come to realize that a competitor's mere knowledge of an existing expert system project does not mean that such an effort could be easily duplicated.

Most banking expert systems efforts are in the early stages. While a few projects are nearing delivery, tools and applications vendors still have their work cut out for them in demonstrating to banks that expert systems technology is not all sizzle. Indeed, opportunities exist for those banks willing to accept the challenge. •

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Cashing in

FROM PAGE 70

change won't happen overnight."

The packages generally consist of a customer information system, an asset product, a liability product, both time- and demand-deposit accounting systems, general ledger, budgeting and an integrated loan product. They offer banks more communications between entire systems — a chance to view a customer's account as a whole rather than on an account-by-account basis.

Consultants such as Gillis are unimpressed thus far. "All they are doing is plugging the same jobs we did 25 years ago," he says. "Conceptually they are doing the same things using new tools. Big deal."

Roger Schindler, vice-president of Transdata Corp., a Salisbury, Md.-based banking consulting firm, is not quite as skeptical; he says he believes that these umbrella systems are the wave of the future. The current problem, however, is that the packages force the banks to move too fast. "It's a good idea, but banks have a resource problem: The costs are too high, and there are not enough people with the talent to implement the packages," he says.

While each software vendor promises its own advantages, they do agree that the packages remain a tough sell. Dave Iacino, marketing manager at Cullinet, says that prospective customers all display what he calls "a Missouri attitude." "They are interested, but they all say, 'Show me.' Our predecessors jumped into the pool and made a great big splash and said, 'We've got the answers for the banking community,' and then failed miserably. So the banks are still very skeptical," Iacino says.

Risk management

Beyond integrated software packages, the question remains as to whether banks are making the transition from back-room to front-room applications with their information systems. Gilbert says he believes that the basic accounting systems, in place for the past 15 years, were simply never meant to provide management information and that the proliferation of ATMs and transaction processing does not indicate a full step forward.

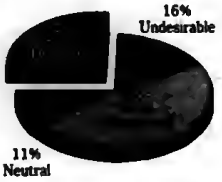
"It is the rare bank that acknowledges that investing in information is investing in a valuable asset," Gilbert states. "To do so is very expensive and operationally complex." Gilbert points to such innovators as Banc One Corp. in Columbus, Ohio, (see story page 69) and Citibank N.A., and praises their research and development commitments to information systems. "But for every Banc One, there are 25 banks not doing what they should," he insists.

Gilbert chooses not to blame bank management for this shortfall. He says that banks bought the technology they needed at the time and that neither the vendors nor the banks' internal developers could have foreseen the evolution that banking was to undergo. "The only issue now is whether people recognize the problem and start taking moves to correct it," he states. "It is not an instantaneous path of correction."

Specifically, Gilbert identifies several areas of both strategic and operational shortcomings in current information systems. A major area of concern, he points out, is in both interest rate and commercial loan risk management. In interest rate risk management, the lack of detailed

Banking software

A January 1986 survey of 1,500 financial institutions showed that acceptance of integrated application software is growing only slowly



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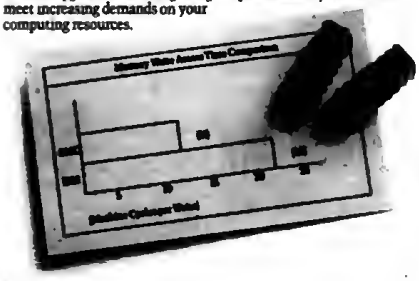

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information on "organizational exposures" puts banks in a precarious position if they cannot determine the risk incurred in their liability and asset management.

"With the systems in place now, banks can get an aggregate picture, but they can't get the detail from underneath without great difficulty," Gilbert says. "The application systems are simply deficient. I'm working with several banks right now on creating bridges between the accounting and analytical environments."

In addition, when it comes to commercial loan or credit risk analysis, banks have excellent accounting systems, but few banks can do detailed portfolio analysis, Gilbert says. A bank wanting to know what its risks were in the agriculture sector, for example, might easily call up its direct loans to farms. But when it searched for its other risk exposures to agriculture-related sectors, such as financing machinery dealers or chemical companies — which make fertilizers — the system would not easily find the relevant data.

"THE KEY is to find something to make you unique and different while at the same time giving you the lowest cost product that the competition can't quickly match."

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"If I'm really worried about what the agricultural cycle is going to do to my bank, I want to know all that information," Gilbert says. "How many banks can do that?" Portfolio management systems using artificial intelligence technology are entering the scene, but slowly (see story page 72).

Transactional systems

While the extraction of management information to gain strategic advantage is lagging, it is not the only area of unfulfilled expectation. The use of electronic transaction aystems in the march toward a paper-free banking environment has not produced anticipated results either.

Although electronic wire transfer setups — for example, international systems like the Clearing House Interbank Payments System, or CHIPS, and Society for Worldwide Interbank Financial Telecommunications, or SWIFT — have been in place and used effectively for large banking transactions during the past 20 years, the domestic use of electronic banking in a retail environment is not living up to its original promise.

Despite predictions of a checkless society, the check remains a ubiquitous vehicle for financial transactions. In 1986, more than 44 billion checks were written in the U.S. alone. And automatic clearinghouse (ACH) and home banking — ideas designed to pare that number — have done little to alleviate the mountains of paper created by the checking system.

"When I see that the major banks in this country are unable to accept electronic payment, I find that incredible," states George White, president of White Papers, Inc., a Montclair, N.J., consulting firm specializing in electronic funds transfer systems. "You cannot pay Citibank, for example, from a home banking system for a mortgage, credit card payment or installment loan. You think of them as a leader in banking technology, and they don't accept payment other than with a check." White points out that home banking, highly touted with the advent of personal computers, has been a disaster. The few systems that do exist generally slow down rather than speed up the system.

In addition, the ACH — automatic electronic transfer of, for example, payroll and Social Security checks, a 15-year-old idea — has succeeded to some degree but nowhere close to that anticipated. Direct-deposit systems are in place nationwide, but last year only 700 million ACH transactions took place. The number sounds impressive, but White declares the system is vastly underutilized, pointing out that the statistic represents only 2% of the total check volume, and half of the 700 million is derived from existing paper transactions — like insurance drafts — transferred to electronic media.

"The check system works well, and it is cheap, so the banks haven't promoted direct deposit," White says. "The federal government has had tremendous success with direct deposit, getting over 40% of the recipients of Social Security to use electronic deposits. But less than 1% of bill-paying is done electronically today. The banks are nonusers; they offer it to others but don't use it themselves. It's a wasted opportunity."

Not everyone views the ACH as a failure, however. For Chase Manhattan Bank, the leading private sector provider

Continued on page 79

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Banks move to branch automation

Competition in banking industry requires innovative merchandising techniques

BY PETER A. COHEN

In the widening frontier of competitive banking, branches are strategic forward outposts. In addition to their traditional responsibilities for handling routine cash transactions and providing customer service, branches now perform a merchandising role: They are retail outlets for bank products.

Banks understand this new sales role for branches, and they are beginning to take steps to support it with technology.

A wealth of branch automation products are available to the bank MIS manager making purchasing decisions. Automated teller terminals, platform workstations, interactive automated teller machines, sophisticated application software and communications products are all proven applications.

The most significant hurdle for banks to overcome, however, is implementing these technologies.

The bank MIS professional must ask: How can I use technology most effectively, considering the banking habits of retail customers, the changing competitive environment, rapid technological advances and the computer systems already installed?

Testing the waters

Lacking a clear answer to this question, banks are proceeding with caution.

Most small and medium-size banks are still in the observation stages, awaiting the experience of others before committing themselves. These institutions may only now be installing automated teller terminals or ATM networks.

Larger banks are moving more aggressively with branch automation. Many have already instituted teller terminals and ATMs to enhance productivity. Now they are beginning to use systems that directly help the branch sell more products.

Platform automation systems are one example of such sales tools.

Major platform automation system vendors

Company	Product
Bunker Ramo Corp.	Aladdin
L.M. Ericsson	System 2100
ISC Systems Corp.	Pinnacle
IBM	4700
NCR Corp.	BAS 5000
Unisys Corp.	EF 7000

INFORMATION PROVIDED BY INTERNATIONAL DATA CORP.

Found on the desks of platform officers, these setups usually consist of workstations that are connected to an in-branch host controller — typically a small minicomputer — which, in turn, is linked to the bank's central mainframe. The workstation can run applications residing on the in-branch host, operate as a personal computer in Microsoft Corp. MS-DOS or access the mainframe as a terminal emulator.

Baybanks, Inc. in Massachusetts has installed workstations on the platforms of each of its more than 200 branch offices. Berman Technologies Corp.'s Cross Sell application running on an in-branch NCR Corp. Tower minicomputer enables platform officers to simulate for the customer the performance of various financial instruments.

Demonstrating the savings accumulated in an individual retirement account over 30 years, for example, can be an effective selling device.

BANK MIS professionals must ask: How can I use technology most effectively, considering banking habits of customers, the changing competitive environment and technological advances?

The application also includes a tickler file function, reminding a platform officer, for instance, of a customer's expiring certificate of deposit.

Because the workstation is linked to the central information file on the bank's mainframe, the bank officer can quickly review all of the customer's accounts, thereby serving the customer better and developing a stronger business relationship with him.

There are many platform automation systems on the market, and the bank MIS chief should consider several criteria in the evaluation process:

- **Vendor's experience.** Carefully

Cohen is a senior consultant with International Data Corp., a market research firm based in Framingham, Mass.

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assess the vendor's experience in providing platform automation systems. This is especially important in selecting software. Bunker Ramo Corp., Unisys Corp., IBM, ISC Systems Corp., NCR and others have all established reputations for reliable hardware, including teller terminals, platform and manager workstations and in-branch host controllers.

Many software packages and vendors, by contrast, are not so well established. And the success of the system depends heavily on the software:

• **Support and training.** Installing a platform automation system requires a high level of support from the vendor.

Software often must be partially customized, hardware configurations must be developed for each site and communications links to the mainframe must be built. Remember, too, the importance of effective training. The system will not work to advantage without skilled platform officers.

• **Connectivity and flexibility.** A platform automation system should be able to both communicate with existing branch systems and the central mainframe and to change as the bank's requirements change.

It should be relatively easy to add new terminals, printers or other hardware to enhance software applications or to expand communications capabilities.

• **Evaluation committee.** A committee reviewing platform automation systems should include representatives from retail banking and finance/auditing as well as from MIS. Branch managers' participation is essential in ensuring that the system can support the merchandising goal, which is selling bank products through the branches.

A few large banks have taken steps beyond platform automation in an effort to support the branches' sales role. A number of innovative projects are using interactive graphics systems to enable customers to browse through bank products by themselves. These systems typically include a touch-screen terminal on a personal computer running graphics-based software. The PC may be in stand-alone mode or may be connected to a remote processor.

The success of these installations, however, requires a detailed understanding of how the bank's customers use branches and how they make financial decisions.

Connecticut National Bank in Hartford recently developed a pilot installation of customer-activated touch screens, but only after completing an in-depth examination of customers' banking habits. The bank's research led Christopher Bergstrom, vice-president of the Delivery Network Development Group, and his team to design the system around several key elements.

• **Focus on the customer.** The system's presentation focuses on the customer's financial needs — such as buying a house, saving for retirement or paying for college. The program encourages the customer's involvement, solicits his questions and provides services in a more personal manner.

• **Make it credible.** The system is designed to earn the customer's trust as well as to avoid obvious biases in the presentation. Bank products are not the primary feature.

• **Avoid glitz.** The installations invite the customer's use. The touch-screen terminals are easy to use, and there is no effort to show off technology for its own sake. In fact, Connecticut National rejected a high-tech, chrome-and-glass setting for the system, choosing instead a more conservative, traditional look felt to be more approachable.

• **Make it accessible.** Bergstrom has been experimenting with installing the system in locations that are busy enough to be seen and draw users' attention to it, but not so busy that the customer might feel uncomfortable spending a few minutes using it.

• **Recognize limits.** The system is designed to help a customer understand the basic need of meeting a particular financial requirement. In considering a home mortgage, for example, a customer can use the system to become familiar with the terms and relationships of down payment, interest rate, terms, points and monthly payment.

When the customer is finished browsing, however, a knowledgeable platform officer must provide further information in order to close the sale. The terminal is not a substitute for an effective platform representative.

Over time, interactive terminals and other technologies will change retail banking. This process will, however, take time. It requires educating banks as well as customers. And as the rocky evolution of ATMs and home-banking systems has demonstrated, customers' banking habits change far more slowly than technology. •

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Cashing in

FROM PAGE 75

of ACH, the system works. "We are getting an adequate return on our investment, and the monthly volume is quite high," Giaquinto says. "It's not the greatest thing, but it isn't a dismal failure either. The system works best when there is a regularity to payments, such as car payments, payroll or insurance payments. That's where it's taken off."

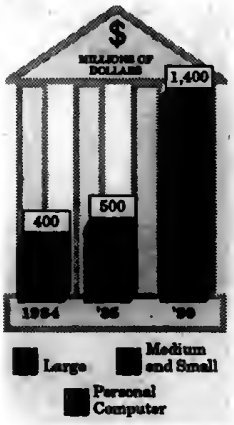
Banc One's Fisher is also a supporter. "The ACH works," he contends. "If you get the politics out of it, it would work a lot better." The problem is that banks are more interested in protecting their existing marketing base than in building a workable low-cost ACH mechanism, Fisher explains. Encouraging more people to use the system is what is necessary, and that is starting to happen.

"I'd like to see 80% of Social Security and 50% of payroll on it," Fisher says. "The guaranteed deposit is a unique and valuable consumer service. We've proved that by getting the little old blue-haired ladies to use it for their Social Security checks. The last person in the world you'd think would rely on electronics would be the retiree who has to have the money in the bank on the third of every month. Yet a third of all Social Security checks are handled through the ACH."

White, however, remains skeptical. He says that as long as the Federal Reserve System keeps the costs of the checking system down and technology keeps it moving fast, the need for electronic banking will never become a reality. "Unless there's some motivation to save money, you won't see the checkless society," White declares.

Banking / financial application software shipments

Once user shepticism is overcome, integrated application software packages will be in demand



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CW CHART: MITCHELL J. HAYES

Communications woes

Banks are also facing data communications questions. Charlotte, N.C.-based NCNB Corp., the largest bank in the Southeast, is currently planning an implementation of a data communications network architecture to accommodate its 600 branches in five states.

According to Joe Whiteaker, vice-president of telecommunications, the bank is seeking to consolidate its existing networks, which focus on several different applications. "Each network evolved over the years," Whiteaker says. "Each has its own protocol, and technology didn't allow them to be consolidated. That has changed, and it is especially important for us to consolidate so that we can present one bank image to customers in every state."

Whiteaker is evaluating methods for consolidation and is consulting with both Citibank and Bankamerica Corp. "In time, everything is going to be available through an on-line network, and the emphasis is to have well-managed, cost-effective network services. Then it will be viewed as a strategic weapon in the marketplace," Whiteaker says. "Right now, banks fail because of bad loans. But in the not-too-distant future, a failure could occur because of a network failure; there's that much emphasis on network delivery." •

Wells Fargo

Banking Card

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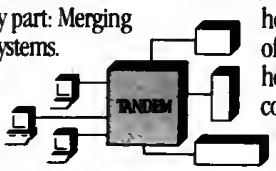

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Maintenance giant sleeps undisturbed in federal data centers

Control over software maintenance is not just 'nice to have' if you own 20 billion lines of code

BY RICHARD HARRISON

During the past several decades, the federal government slowly and quietly accumulated what today amounts to the single largest portion of the world's software assets. No one possesses a true inventory count, of course, but the federal government is estimated to own about 20 billion of the world's 75 billion extant lines of code — and the number grows with each passing day.

There is probably no algorithm known to mankind that a federal programmer has not reduced to code once and possibly more than once. No computer language ever existed, at any implementation level, that is not represented in one or more federal source libraries.

Possibly the only other number of significance counted in Washington these days requiring more zeroes than the total federal software inventory is the combination of the national debt and the trade deficit.

Subsequently, federal software management techniques in general, and software maintenance practices in particular, have become important and pressing issues — issues that consume more of management's time than in the past but with fewer positive results.

IVAN BANYAI

Out of the spotlight

Given the ever-increasing magnitude of this problem, one would think the software maintenance management challenge would raise a few eyebrows, draw a little press, rattle a few cages or, at the very least, shake a few cores. But despite the annual expense of maintaining the federal government's software assets' reaching approximately $3.5 billion, little attention seems to be directed at the management problem.

Federal executives and information resource managers alike increasingly fail to recognize the scope of the maintenance management problems with which they are now faced. In their eyes, the expanding maintenance burden lacks visibility and defies solution. Still, the adverse impact of increased maintenance investment on advances in software management productivity has reached major, debilitating proportions: Each dollar that goes into maintenance drains the resources for development. Thus, the federal government's continuing romance with the code could devastatingly affect its ability to manage competitively.

Of course, federal managers do not totally ignore the need to stem the rising cost of software management. The Office of Management and Budget (OMB), for example, issued a binding directive, "Management of Federal Information Resources" (OMB Circular A-130, 1985), requiring, among other things, that maintenance costs be reduced by 25% during a three-year period.

But many, indeed perhaps the majority of, federal managers are more concerned with software development and the

Harrison is director of the U.S. General Service Administration's Federal Software Management Support Center in Falls Church, Va.

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means of increasing development productivity than reducing software management costs. They have become especially enamored with the promise of so-called fourth-generation technologies.

Software tools in general are constantly and consistently touted as the basis for drastic productivity increases in development environments. But, as Software Productivity Research, Inc. Chairman T. Capers Jones recently observed, the bulk of the productivity measures presently available within the industry to increase efficiency in software development do not necessarily live up to their claims. This is primarily because the tools being offered fail to automate the most labor-intensive aspect of the development process — communication.

Today's application generators and fourth-generation technologies are akin to yesterday's automatic program translators: They apply a degree of efficiency to a portion of the logistic that accounts for only a small percentage of the process. Unless, or until, productivity aids are brought on-line — thus increasing communication between those people and organizations that require support and those who develop the means of delivery — productivity in software development will continue to lag.

It's broke, and ya' gotta fix it

Doubtless, there is a need to develop more productive ways of building the federal government's software. But rather than place emphasis — and it is a significant issue — on better ways of putting more code into operation, the government must recognize that its existing assets consume the majority of its software management budget. Software maintenance consistently proves itself to be the information resource element least susceptible to meaningful productivity increases or cost reductions. Subsequently, federal managers must begin to shift their attention to maintenance and assume some responsibility for what they have already created. A compelling need exists to pursue development of improved maintenance practices.

It must be further recognized that this need is not the least bit technical in nature. Nor does it fall into the category of "nice-to-have but otherwise unnecessary." As Mel Colter, professor at the University of Colorado and one of the few academics today who focuses his attentions on software maintenance issues, points out, the financial stake is highly significant. Maintenance improvements will provide the greatest immediate return on investment of the goverment software management dollar.

Colter uses a simple example to prove his point. Assume, he says, that an MIS vice-president invests 45% of his DP dollar in new development and 55% in maintaining the existing inventory of code — a very reasonable assumption. Assume further that an equal level of increased productivity — say, 10% — can be achieved in both these investments. In which investment is the greatest absolute return realized? The answer, of course, is maintenance. The only odd thing is that in the federal government the existing investment splits are more commonly 70% to 30% in favor of maintenance, and thus the potential for return is even greater.

Notwithstanding the compelling economics, the government's maintenance costs continue to rise. Code inventories proliferate at such a rapid pace that it is almost as if they had discovered how to reproduce themselves. The government is rapidly losing the ability to count, much less manage, this code and the applications it was meant to implement.

A great number of research efforts are under way to develop and implement solutions to this problem; among them, the concept of reusability shows tremendous promise.

Study of this approach is certainly high on the agenda of various research corporations, such as the U.S. Department of Defense-sponsored Software Engineering Institute and the privately financed Software Productivity Consortium. Clearly, reusability, combined with a few other techniques aimed at building code in more efficient ways and, more importantly, building it so that it can be managed in implementation, are important steps that must be taken as soon as possible.

Advances in software production and operations must be brought on-line rapidly if there is to be any hope that the predictions of unrestrained and unmanageable growth will be curtailed. But despite scientists' and engineers' best efforts, the federal government may be looking at a 10- to 20-year germination period in developing these techniques and effectively putting them into use. Whether the U.S. can afford that much time, especially considering its competitive stance worldwide, is questionable.

For instance, Japan reportedly is

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running circles around the U.S. in increasing the code productivity — the number of usable, useful lines produced per day against the number of man-days it takes to produce them. It has also been reported that the Japanese are now having to run to stay ahead of Korea.

Experts argue the merits of this productivity race on a regular basis. They contend that Japan and other competitors have an easy row to hoe.

The competition does not create anything really new, these experts say; they simply find more effective ways of duplicating designs that U.S. programmers sweated blood to originate. Anybody could do that, according to these gurus, especially if they are subsidized by their government in the process.

If what these observers say is true, the U.S. need not foster any fears whatsoever. Since this country is not producing much in the way of new and better designs these days, all it has to do is wait. The U.S.'s competitors' grist mills will stop

IF CHANGE is simply truth passing in and out of fashion, then the time has come to make fashionable a simple truth: We can bridge the gap to the future by improving the maintenance procedures of the present.

for lack of its shipping them more wheat to grind, and this country will be right back in the driver's seat.

Not likely.

It may be true that some of this country's competitors have jumped ahead on the basis of harvesting the seeds the U.S. sowed, but at least they were willing to engage in the harvest. They were also willing to invest a little of the return to ensure that they manage their farms well: They don't till their fields with mule-drawn plows.

If the U.S. is designing less with each passing year, this happens because it replants the same seeds in increasingly less productive fields. The amount of time and money invested in this endeavor is diverted from supporting development of new and better techniques with which it might otherwise husband its crops.

To shorten the germination period in the development of new technological processes that will allow the U.S. to regain a commanding and prominent competitive position in software management, it must invest greater sums of money and engineering effort in the research process, and it must do this within shorter periods of time.

The option to do so, however, will not be available if it must invest simultaneously in managing current software inventories using the same old techniques. The funds are simply not going to be available.

Understand the rules

But like a lot of problems faced today, the situation is not nearly as bad as it appears to be, so long as it is approached with the idea of changing it for the better. If change is simply truth passing in and out of fashion, then the time has come to make fashionable a simple truth: Federal software managers can bridge the gap to the future by improving the maintenance procedures of the present. If this is accomplished, the cost of current and near-term software maintenance operations will drop, creating additional financing for developing the techniques with which future problems can be approached.

So what, generally speaking, can be done to work toward improved software maintenace management? The best answer is probably the same one the coaches come up with when nothing seems to go right on the playing field: Get back to basics. Before you can play the game, you must fully understand the rules and be capable of executing the fundamental plays.

In software management, the rules are predicated upon consistent methods, consistently performed. It makes not a whit of difference how elegant a design methodology is if it cannot be understood by the designers, if it cannot be duplicated or if, as is quite commonly true, its resultant product is totally unmanageable. Moreover, if various otherwise workable methodologies proliferate throughout DP shops, confusion reigns.

Thus, the first and most important step requires that every DP shop develop and put to use a formal method for consistently implementing its maintenance procedures. These procedures must define what constitutes maintenance in the shop and the training required for one to perform such work. They must describe the tools available for use and how they are to be used; they must set forth the standards by which the shop is governed and the quality control process imposed to ensure those standards are met. Nirvana is found in the complete integration of these procedures across development and maintenance lines.

Some will look at this suggestion and say, "Whoa! You've got it backwards. The software engineering environment must be established at the requirements and design level. If it's done right there, maintenance is a stroll on the beach." I would contend that federal DP shops have been strolling that beach for years and possess little more to show for their efforts than footprints in the sand.

It is certainly true that requirements analyses must properly interpret the users' needs, and system designs must implement those requirements in such a manner as to serve those needs. It is also true, however, that the systems being

designed, particularly in federal government operations, must take into consideration the return on investment made.

If putting systems up takes a year, or two or six — and it does — some assurance must be offered that these systems run sufficiently long and efficiently enough to amortize investment in the effort. It is not enough for developers to say that users are satisfied with their work on the day the system goes into production, only to find the selfsame users screaming bloody murder a week later when the system goes haywire and the maintenance folks can't make heads or tails out of its operating characteristics.

Maintenance is a user, too. Maintenance needs to get its two cents in when the system is going up; it needs to advise the developers of its requirements. To do this, it must employ clearly defined methods of operation. According to surveys performed by the Orlando, Fla.-based Quality Assurance Institute, about 40% of the shops in the private sector reportedly employ such procedures. No statistics are available on the percentage of federal DP shops with similarly defined maintenance approaches, but even assuming these shops are in no worse shape than private shops, they are in dire straits.

Power, yes; terminals, no

The second most important step is to provide appropriate technology with which to perform the job at hand. While most federal DP shops are generally well equipped in terms of gross processing power, few have acquired the diversity of equipment necessary to underwrite acceptable support for the thousands of programmers and analysts they employ.

The Federal Software Management Center still finds, for example, that despite the large numbers of equipment installed, programmer-to-terminal ratios are in the 5-to-1 range. Gross processing power is of little value if, for the privilege of use, the programmers are required to take a number and get in line.

Next to ease and convenience of system access, the lack of good software maintenance productivity tools is a highly significant problem. The government's notoriously complex and lengthy procurement regulations may account for some of the tool shortage. Even simple purchases seem to take ages to procure and cost a small fortune. The process has a way of discouraging the most determined DP managers from acquiring more and better tools. But rules are something with which we must all contend, especially in an economic sector financed by tax dollars.

It is likely, however, that the federal government's procurement rules are more often convenient excuses for maintaining the status quo than barriers impeding progress. Federal managers are frequently characterized as living in a fishbowl; their every action seems subject to constant review from a myriad of sources ranging from the individual taxpayer to Congress and everyone in between. As a result, they are quite adept at avoiding decisions that cannot, in one manner or the other, be thoroughly and reasonably justified or rationalized.

Federal managers are not afforded the luxury of making mistakes, even though a well-managed trial-and-error approach to problem solving is usually effective. Instead, safe rationalization can, and often does, become an end in itself.

One persistent rationale in acquiring maintenance productivity tools is that all software running today is going to be replaced eventually, so why bother investing in tools and people? Not surprisingly, this same rationale has persisted for a number of years. Unfortunately, it has fostered the creation of an embedded patchwork of maintenance practices that are becoming more difficult to finance.

It is foolish to ignore a software investment that has not been entirely amortized and continues to return a dividend. Even if the software does eventually go away, something will be established in its place and will require care. Regularly investing in software maintenance tools and training people to use them is, therefore, entirely worthwhile.

Software maintenance personnel are going to need tools to address the future, no matter what shape it may take. Failure to invest in maintenance will significantly impede progress, which will in turn push the future farther away. Much of

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making the future happen lies in adapting to cultural change, and extensive use of and reliance on tools is, in fact, a change in culture.

The final point addresses the problem of changing cultures. The fall 1986 "Software Maintenance Practices Survey" conducted by Bill Perry, executive director of the Quality Assurance Institute, posed the following question: "Do you have any programs or systems that have to be maintained by 'certain' people because no one else understands the logic?" Sixty-three percent of approximately 200 responding organizations answered yes. A corollary question followed: "If yes, how great a portion of your software portfolio is managed by these people?" The answer: 22% of each portfolio.

MAINTENANCE is a deteriorating process that, when combined with a lack of defined procedures and a high personnel attrition rate, often results in the most important programs being placed under the care of a handful of the most skilled members of the shop.

Perry probably should have asked one more question in this category: "What portion of this 22% constitutes the organization's more important operations; that is, just how much do you rely on 'certain' people to ensure that the system works every day?"

We hesitate to guess what the answer to the last question might be. Experience shows that 22% reliance on "certain" people is probably not unusual. Much of the federal government's software is quite old. It is common to find large elements of the inventory used continuously for 15 years or more — elements that have been subjected to a tremendous amount of maintenance. Maintenance is a deteriorating process that, when combined throughout the years with a lack of tools and defined procedures and a traditionally high personnel attrition rate, can and often does result in the most important programs being placed under the continual care of a handful of the most skilled members of the shop.

This tactic invariably satisfies the short-term needs of management and, to some degree, the psychological needs of these so-called certain people. Unfortunately, this tactic also probably creates as many problems as it solves.

For one, those outside this skilled handful find it much more difficult to understand the software they are charged to manage; this group includes both programmers and DP managers. In this regard, they are less productive than they otherwise could be.

Second, short-term approaches that rely heavily on the skills of a handful obviate an organization's ability to increase the return on its software investment. About 70% of all software maintenance work is classified as "perfective," which is a polite way of recognizing that most system designs are flawed both in terms of substance and durability. The fewer people involved in this process, the less time there is to analyze the perfective maintenance moves, resulting in a greater possibility that the perfective process will also be substantially flawed and be returned with increasing frequency for more maintenance. It is this vicious cycle that, more often than not, catalyzes a user hue and cry to initiate development of a new system to replace the one that never works, and the cycle continues.

Finally, programmers — like most people — resist change to one degree or another. Subsequently, management finds its suggestions for diversifying the work load, implementing new techniques, installing productivity tools and the like are consistently overridden by a suspicious group that sees the proposed changes as mere subterfuges aimed at reducing its importance to the operation.

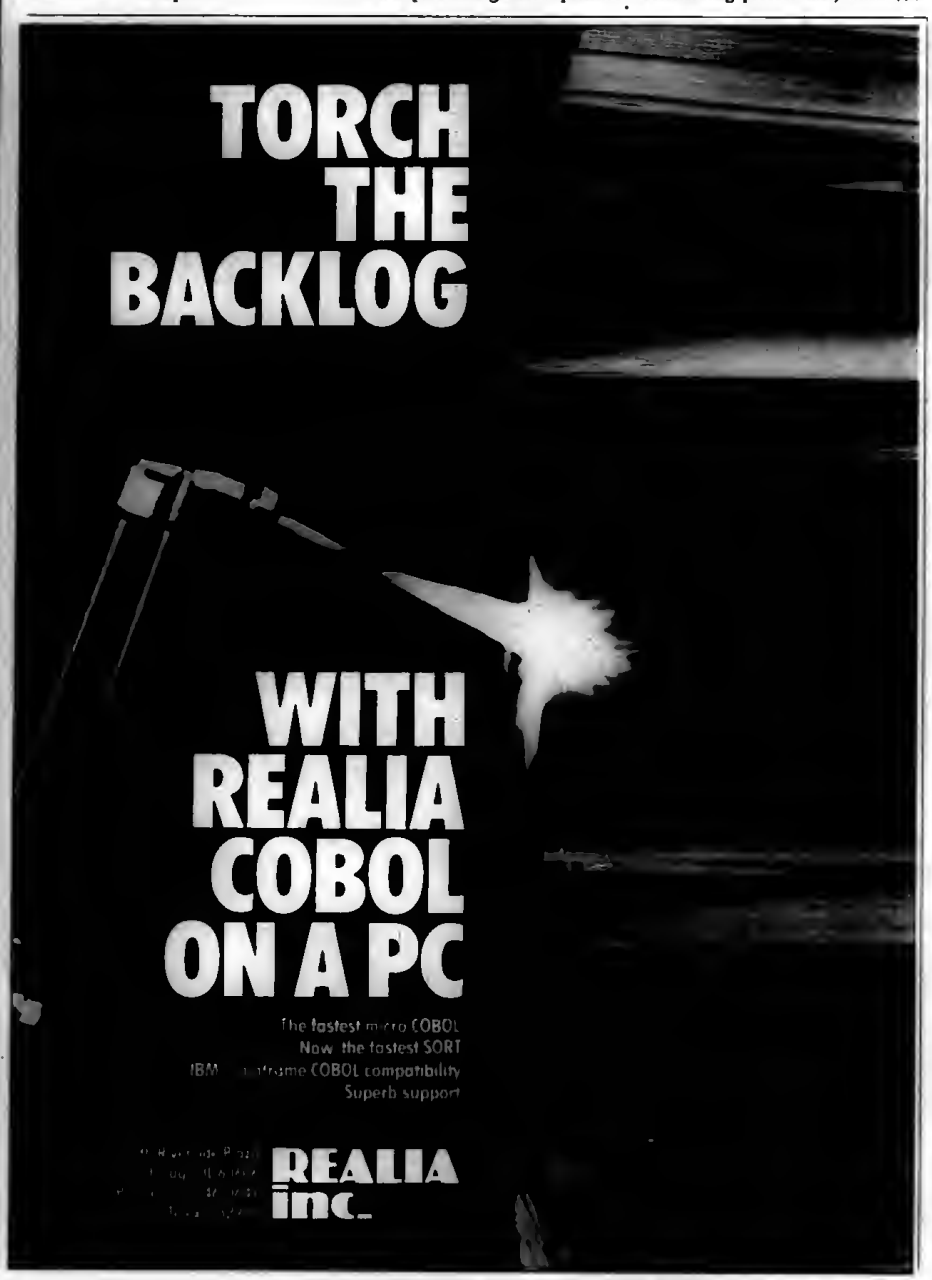
Under these circumstances, most attempts to innovate are either compromised to a meaningless degree or stalemated. Thus, federal managers must do their utmost to ensure that analysts and programmers make the transition through periods of cultural change relatively unscathed; otherwise, all hope of ever increasing federal DP shops' productivity may as well be abandoned at the outset.

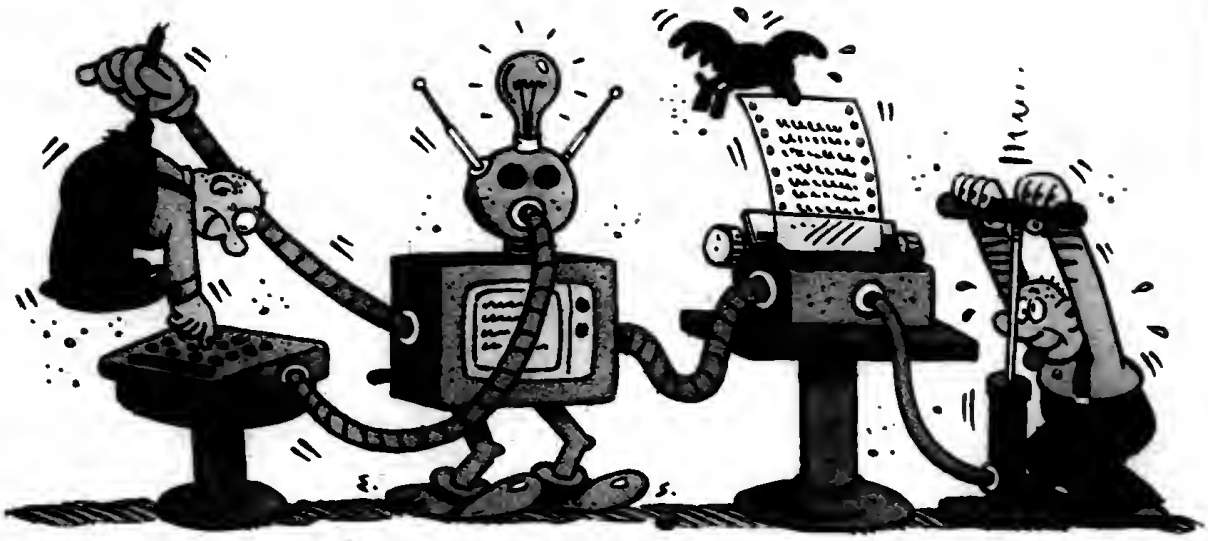
Bringing in the sheaves

Federal software maintenance is a fertile field just waiting to be tilled. For those who are capable of accepting the challenge, the harvest will be bountiful, productive and satisfying.

More and better maintenance practices, procedures, people and tools can generate the financing that will substantially offset the costs of advancing the federal government's technological processes and improving its ability to build and manage better software in the future. It is hoped that prudent federal executives will devote more thought to this issue than they may have in the past.

As a body, it is important that they take aggressive action to protect the investment made in the federal software asset. In so doing, they could contribute inestimably to improving the business of governing the country. One thing, though, is certain: Simply romancing the code no longer works. •





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Get out from under

Project management techniques borrowed from other professions can rein in typical software budget overruns of 100% to 150%

BY WILLIAM DUNCAN

Thirty years ago, the typical software development project finished much later than planned, cost far more than was budgeted and contained less than the desired functionality. During the intervening years, programmers developed a variety of tools and techniques to correct these shortcomings. Spaghetti code was given up for the rigors of structured programming, design and analysis. Developers traded assemblers for compilers and now use fourth-generation languages.

And the typical software development project is still behind schedule, over budget and less functional than the user expected.

Three decades of minimal progress cannot be explained away with a single answer. One major factor for the gap between effort and success, however, is the lack of improvement in DP project planning and control practices. Many project plans budget time to review deliverables but not time to correct them. Ballpark estimates quickly become budget commitments. Control systems are used to demonstrate progress when there is none.

Project management techniques may be likened to a flat tire, software engineering techniques to premium gasoline: The extra octane will not improve performance until the tire is fixed. Yet many software project managers contend that accurate planning is impossible because of the unique characteristics of software development:

- Never-been-done-before projects.
- Unclear or conflicting specifications.
- Frequent changes in scope.
- Externally imposed schedule constraints.
- Technically naive users.

Duncan is president of Duncan Associates, a project management consulting firm in Lexington, Mass.

But are software project managers really so singular? If you spoke to a project manager in heavy construction or pharmaceuticals development, you would get a list of problems that are not just similar to the above, but identical. If the problems are the same, is there a chance that the solutions will be, too? Can DP really apply construction project management techniques to software development?

The answer is a qualified yes. During the past five years, I have worked with a variety of clients who have tried to apply project management practices of traditional engineering disciplines to software development.

Some developed task templates for frequently performed activities. Others recognized the need to change from task-based to resource-based scheduling. A few established independent estimating groups.

Most of these efforts, however, never achieved the expected results. Why? Because they failed to adopt the three key elements of the underlying philosophy of project management.

First, the project manager's primary responsibility must be defined as delivery of quality. Quality, in turn, is defined as producing a system that conforms to specifications. This emphasis on quality does not mean that a project manager should be allowed infinite time and resources to complete a system.

It does mean that the decision-making dynamic should consider schedule and budget issues in terms of the potential impact on quality. For example, code reviews, testing and other quality-control activities are often the first things cut when schedule slippages occur. Yet, when given the choice, every user with whom I worked opted for late delivery rather than diminished quality.

Best-laid plans

Second, project scope is defined by the project plan; system scope is defined by the specifications. This means users must review the plans as rigorously as they review the specifications. It also implies that software project managers must construct project plans that allow for such unexpected events as staff turnover and operating system bugs.

Finally, poor performance must be penalized. As long as there is no penalty for a poor plan, there is no incentive to develop a good one. A project manager should expect dismissal — and should be dismissed — for failing to meet any reasonable test of quality, schedule or budget performance. The minimum standards of performance insist that a project is on time, on budget and completed according to specification.

These philosophical underpinnings are crucial, since the penalties of implementing professional project management

- **Behind schedule, over budget: same old story**
- **The art of resource-based planning**
- **'Quality' doesn't imply infinite time or staff**

are invariably higher cost estimates and longer elapsed time estimates. Users and management, however, tend to prefer the reliability of the higher numbers to the uncertainty of project managers' current predictions.

Rubik's planning cube

The planning process begins with a set of specifications. These may be brief and general for a feasibility analysis project; they may be extensive and detailed for a systems implementation project.

The specifications are used to identify the tasks necessary to deliver the specified product. The task list and the planned project organization are used to estimate the work effort. Estimates are then combined with task dependencies and staff availability to develop a project schedule.

All these elements are combined with any assumptions that can be made about external constraints to produce the project plan. These activities interrelate like a Rubik's Cube. If we equate a good plan with a solved cube, they share a oumber of characteristics:

- Changes in one dimension cause changes, often unanticipated, in one or more other dimensions. For example, adding a task may require reassigning personnel, which means changing estimates and schedule commitments for existing tasks.
- There is more than one way to achieve a correct solution; once you have figured out a system, the solution is easy. Not only that, but you can teach others to find similar solutions.
- Arriving at the solution requires practice, patience, intuition, trial and error, lots of iterations and often help from somebody else.

The following scenarios cover the key components of planning — task identification, estimating and scheduling — and the interplay among them. The companies and situations in each section are real; only the names have been changed to protect the guilty.

Task identification

Able Co. is an old, established division of a Fortune 500 firm with more than 100 analysts and programmers working on traditional mainframe applications.

Joe was an Able team leader who had just been promoted. His first assignment was to "fix" a project that had already burned out two other team leaders in less than a year's time.

The project involved converting one of Able's key production systems to new, centralized hardware located at the parent company's facilities. The hardware vendor had promised that its conversion programs would complete 90% of the work involved.

The project had been budgeted at $100,000 bot had consumed $200,000 to date and was oowhere near complete. In addition, the project had become a political hot potato, leading Joe and his boss to bring in an outsider to complete an independent assessment.

Joe was aghast when he saw the preliminary task list that was generated by the assessment. "I can't put all those things in my plan," he moaned. "I'll get fired!"

The tasks on the list that concerned Joe fell into two categories. The first group consisted of administrative tasks: periodic replanning, budgeting review and revision time for deliverables, holding status meetings and securing necessary resources like terminals and passwords for team members.

ARRIVING at a solution in the project-planning process requires practice, patience, intuition, trial and error, lots of iterations and often help from somebody else.

The second group consisted of technical tasks with a political dimension. For example, source code had to be found before it could be converted. The installation lacked a reliable production source code library. As a result, conversion required testing several different source versions against the production object version to figure out which was current. In a few cases, no source was available at all.

Both the administrative tasks and the political issues would have been identified if Joe's predecessor had been required to develop a work breakdown structure. Developing this breakdown structure involves a functional decomposition of the work effort. In effect, it is a structured approach to task identification.

The output of the process may be a tree diagram, an outline or a Warnier-Orr diagram.

The key is for the lowest level of decomposition to list tasks with sufficient detail to estimate. For example, the "manage project" section of Joe's work breakdown schedule included the following items for developing the weekly team meeting agenda:

- Review prior meeting's minutes for open items.
- Review notes and correspondence for new issues.
- Draft agenda.
- Type, review, revise and distribute.

Providing sufficient detail means accessing directly comparable data from prior experience. Where no data is available, it should be developed before accepting the breakdown structure.

For example, the lowest level of detail in Joe's predecessors' plans was "convert

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source program." With no directly comparable experience in converting Able's programs from one machine to another, they left this lowest level insufficiently detailed.

If these developers had first tried to convert one or two programs, thus providing comparable data, they would have known to decompose the "convert source program" stage into several stages: find source, validate source, run vendor conversion program, test converted code.

Structuring the task identification effort in this fashion also facilitates the construction and reuse of common groups of tasks such as user interviews, deliverable preparation and review, testing and project management. A library of breakdown structures will also help highlight situations such as Joe's, in which some research was needed to provide sufficient detail.

Joe eventually bought into the task list. When all the work was estimated and costed out, the total conversion effort carried a price tag of more than $1 million. Joe presented the plan, and the project was killed.

Several months later, I heard that Joe had left Able, and nobody knew where he had gone.

I like to think that he got fed up with the mismanagement and quit, but I can't help wondering: Did he get fired because of "all those things" involved in his project plan?

Sample contingency factors

Base estimates for each task are subject to a certain level of uncertainty, as every project manager knows. Contingency factors like those below quantify the uncertainty for each type of task because some tasks are harder to estimate than others.

Tasks	*Contingency factor as percent of base estimate*
DESIGN	
Draft design	10%
Final design	15%
DEVELOPMENT	
Coding (clean compile)	10%
Debugging	15%
Documentation	15%
Integration testing	25%
OVERHEAD	
Vacation, holidays	2%
Administration, staff turnover	5%

CW CHART

Estimating

Wes is vice-president of MIS for Baker's Shops, Inc., one of the nation's largest retailers. The actual cost of his projects ranges from a low of 50% over budget to a high of four times the original estimate; the average is 80% over. Wes is pleased with these numbers, since his objective is to keep his average variance less than the industry average, which he perceives to be in the 100% to 150% over-budget range.

Jill is a project manager for Charlie & Co., an entrepreneurial firm building state-of-the-art micro-based graphics systems. Her defined objective for estimating is accuracy. Her actual costs are usually within a few percentage points of her original estimates.

Charlie's programmers and analysts clamor to work for Jill, since they seldom work nights or weekends to meet deadlines. Her boss is less enthusiastic — he accuses her of padding the budget.

WES'S approach does not satisfy the objective: to determine the maximum probable cost for resource allocation purposes. It reminds me of the old joke about the person with one foot on the stove and one in the icebox — on average he is comfortable.

Drew is a programmer/analyst for Diamond Corp., a small service firm with only 10 people in its MIS group. He always estimates his projects high — three to four times what he really thinks is needed. As a result, he almost invariably completes his work ahead of schedule and under budget. This satisfies his objective of exceeding expectations. His users are alternately frustrated by the projected cost of his projects and delighted by the actual performance.

All three of approaches listed above produce good estimates in the sense that each meets the planner's objectives. But are these objectives appropriate? A construction engineer will tell you that the objective of estimating is to determine the maximum probable cost to facilitate appropriate resource allocation.

Wes's approach does not satisfy this objective. It reminds me of the old joke about the person with one foot on the stove and one in the icebox — on average he is comfortable. Drew's approach is to estimate the worst case or the maximum possible cost; again, the objective is not satisfied.

Only Jill's approach satisfies the objective set by construction engineering.

But even if you accept the value of an accurate estimate, just how do you go about developing one? Jill accomplishes it by reinventing three key techniques that

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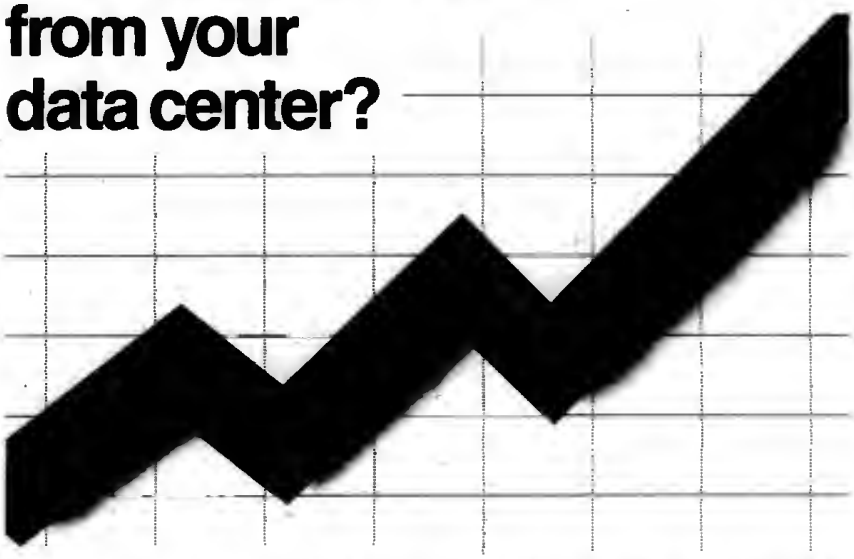

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are consistently applied in construction engineering.

• First, her estimates are resource based. A construction estimator knows that a foundation hole can be dug by bulldozers or backhoes; bulldozers do it quicker, cost more per hour and leave a different-shape hole than backhoes.

In the same fashion, Jill recognizes the need to accommodate different skill levels in her planning and to adjust her base estimates according to which individual was actually assigned to the task. A study launched several years ago showed that comparably experienced programmers took anywhere from three to 25 hours to solve the same problem in Cobol. Jill merely incorporated this insight into her plan.

• Second, she involves those actually involved in the estimating. After ensuring that they know she wants a maximum probable estimate, Jill asks each one to develop an independent assessment of the assigned tasks.

The estimators then meet as a group to review each other's estimates and to resolve discrepancies. If members of the group are unable to reach a consensus and if the estimate in question is significant, they do some estimate prototyping before approving the numbers. Jill's approach actually decreases the amount of effort devoted to planning by minimizing the amount of replanning needed.

• Finally, Jill recognizes that different tasks instill different degrees of uncertainty: Design efforts can always be estimated more accurately than can integration testing efforts.

To accommodate these inherent differences, Jill developed a base estimate using the techniques described above, then increased the base by a contingency factor derived from previous experience (see chart page 91). For example, if she estimates 200 hours for integration testing, she includes a contingency allowance of 50 hours — or 25% — in her budget. While the concept is generally applicable, actual numbers must be customized to each estimator.

Adjusting estimates

Contingencies are not fudge factors: A contingency allowance is used only when needed, and then it must be justified. Contingencies provide for those unpredictable occurrences commonly attributed to Murphy's Law — hardware problems, system software bugs and the like.

By adding a contingency adjustment to her base estimate, Jill is able to produce a risk-adjusted estimate that is very close to the maximum probable cost.

Jill's total contingency-adjusted estimate usually amounts to about plus or minus 15% of her baseline estimate. This compares favorably with U.S. Department of Defense guidelines for research and development projects, for which this figure is considered on the nose. It also fits the profile of most construction engineering projects, which typically have a management reserve of 15% to 20% to accommodate contingencies.

Scheduling

Tom, a manager of applications development for Easy Street, Inc., is in charge of a 30-member group providing design and development services to a state agency as part of a long-term contract. Tom's scheduling algorithm is based on two assumptions: one, that four members is the optimal team size and, two, that any system worth creating should be done in fewer than 18 months.

Tom's planned completion dates are then easy to calculate once a level of effort has been developed — divide the estimate by the smallest multiple of four that would produce a result less than 18. For example, an 80-man-month project should require eight people, since assigning only four would make the project last 20 months. But despite the elegance and simplicity of this algorithm, Tom's projects are usually late.

One day, while discussing yet another slippage with one of his project managers, Tom suddenly saw the light: He realized his scheduling algorithm made no allowance for task dependencies. Tom ran right out to his local computer store and bought a micro-based project management package. He loaded first one project, then another, then another. To his surprise and chagrin, the dates the system calculated were remarkably similar to his own.

Tom naturally blamed the software and eventually asked me to help him select a new package. I was a little surprised, since I knew other MIS groups were using this package successfully. Tom's problem turned out to be pretty basic. He had loaded the package with only summary-level tasks and staffed them all with multiples of four. The software produced results similar to his manual algorithm because his gross-level inputs trivialized the program's calculations — garbage in, garbage out.

To help Tom understand the mechanics of scheduling, I took a representative project of 80 man-months and eight people and loaded it in stages. With the full work breakdown schedule loaded, detail-level-task dependencies pushed the earliest possible completion date to six weeks past Tom's 10-month calculation.

Next, I assigned specific individuals to each task and printed a resource utilization chart. One individual had scheduled three straight months of 14-hour-plus days; another employee indicated a total of six idle weeks at various points in the project.

I then added holiday and vacation schedules and limited each individual to 7½ working hours per day. The schedule now showed a 16-month project. Three people were fully utilized over the full 16 months. The remaining five had utilization rates varying from 20% to 80%.

Since Tom was also a believer in full-time assignments, the work effort was arranged to eliminate part-time slots. In the process, the level of effort estimates had to be adjusted: some up, some down. We ended up with three alternatives (see chart at left). The user department chose Option A: When push came to shove, they preferred cheaper to sooner.

All of Tom's project managers now use micros for scheduling, and Tom is delighted that milestones are met consistently. However, he still mourns the loss of his four-member project teams.

Measuring performance

Hank is in charge of new product design for Fox Systems Co., a commercial software developer selling minicomputer applications to a vertical market. In conjunction with his team leaders, Hank has developed a project reporting system that works off weekly time reports. Every Friday, each employee completes an electronic time sheet to record time spent and time remaining by task. In effect, the project is re-estimated on a weekly basis. Hank wrote a simple program to compare this week's estimate of effort remaining with last week's. On average, the balance remaining decreases weekly by about 1,200 hours.

Hank feels these figures indicate that the project is making good progress. The project is, in fact, making progress, but it is doing so at excessive cost. With 40 people working 40 hours a week, Hank is spending 1,600 hours every week to accomplish 1,200 hours of progress.

Hank's problem lies in trying to measure performance along a single dimension — work effort remaining. Unfortunately, the Rubik's Cube analogy for planning holds true for performance as well: Seemingly minor changes on one face of the cube may significantly change other faces. For example, a projected 2% cost overrun may seem trivial, but if that 2% occurs on critical path tasks, the schedule could be delayed by 10%, 50% or more.

The most effective performance measurement technique I have found is earned-value reporting, which produces reliable, quantifiable and comparable data on project performance. As a result, it is used extensively in many other project-oriented industries such as aerospace, pharmaceuticals, defense contracting and civil engineering.

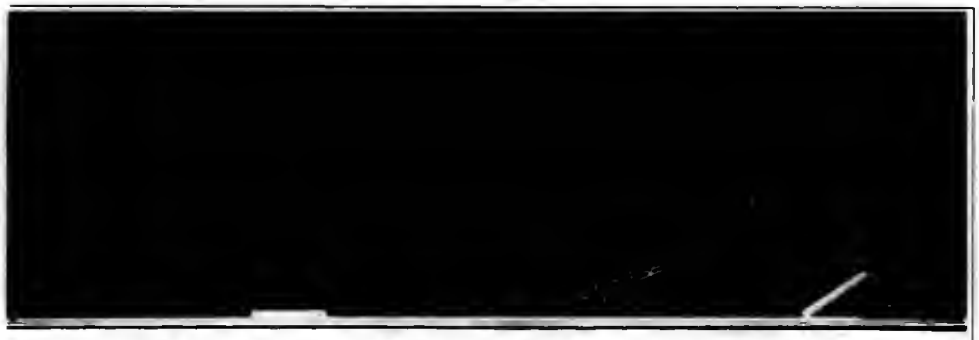
Earned-value reporting

Scheduling alternatives

In these estimates, non-resource-based scheduling does not take task dependencies into account, so the "expected duration" often underestimates the project. Resource-based estimates do plan tasks in overlapping stages, but this may mean workers spend time idle. Options A, B and C propose three levels of staff utilization.

Estimates	Man-Months of Effort	Planned Staffing	Expected Duration (in months)
Non-Resource Based			
Original estimate	80	8	10
Resource Based			
Option A	80	5	16
Option B	84	6	14
Option C	90	9	10

CW CHART



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MANAGERS must avoid the temptation to view project management as the latest entry in the cure-of-the-month club. More reliable plans and performance measurement are necessary but even these are not enough. You still have to do everything else well, too.

works with four basic measures:

- The budgeted cost of work performed (BCWP) is the sum of the original estimates for all completed tasks. All tasks are either 0% complete or 100% complete.
- The budgeted cost of work scheduled (BCWS) is a total of the original estimates for all tasks planned to be complete by now.
- The actual cost of work performed (ACWP) is the total effort expended to date on both completed tasks and on work in progress.
- The estimate at completion (EAC) is simply the most recent projection of total project cost.

All four estimates are normally expressed in dollars, but hours or days work equally well on many projects. Some simple calculations convert the measures into variances:

Schedule Variance = ACWP - BCWS. This figure simply shows whether resources are being spent as quickly as planned. If not, the clear implication is that schedules will slip as the project progresses. Schedule variance is an easy way to communicate the impact of not staffing up as quickly as planned.

Budget Variance = ACWP - BCWP. This is the old planned calculation vs. actual calculation with an important twist: BCWP includes completed tasks only. Thus, the budget variance is a true variance that cannot be distorted by the project manager's naturally optimistic assessment of percentage of completion.

Estimate Variance = EAC (current) - EAC (original). This allows monitoring of the original estimate's accuracy. As the project progresses, estimates should be constantly updated to reflect greater knowledge of the task at hand.

Estimate variance, particularly when plotted from period to period, can provide advance warning of future project problems.

When an earned-value measurement is combined with a well-designed and fully detailed work breakdown structure, it provides a powerful monitoring tool, because each variance may be computed for any component of the breakdown structure.

Additionally, it is important to address significant variances only. For example, John, a project manager at Easy Street, drives himself crazy worrying about two- and three-hour variances on 100-hour estimates. He spends much of his time trying to juggle positive and negative variances between tasks. His projects always atart strong and finish weak because he is too busy juggling to support his team when performance demands hit.

On the other hand, Sally at Baker's, Inc. totally ignores all variances for the first two-thirds of every project. Her theory is that there will always be time to catch up later. Needless to say, there usually isn't.

Professional project planning is a system for developing accurate and realistic plans. The techniques just described are the components of this aystem.

Thus, implementation should proceed through feasibility, requirements, design and development like any other system. Trying to do otherwise is a recipe for failure. Again, my friends at Fox Systems provide a case study in how not to do it.

Scott, a vice-president at Fox Systems, was in charge of a major development project that was expected to take three to four years and $12 million to $15 million to complete. Although Scott had never managed a project that required more than a year or involved more than 10 people, he waa convinced that proper planning would bring this one in on time.

To support the planning effort, Scott developed an extensive "Planning Guidelines and Procedures" manual. The first plan completely filled a 3-in. notebook and was backed up by a 300-page printout of task codes, assignments, estimates and due dates.

Repeating cycles

Within three months, the project was well behind schedule. Scott updated the procedures to accommodate the perceived shortcomings of the previous effort. This new plan consumed yet another 3-in. notebook backed up by a revised 300-page printout. Three months later, the cycle repeated itself.

Morale on the project was incredibly low. The various team leaders complained that they spent all their time preparing and updating plans. "If I didn't have to plan," one said, "maybe I could get some real work done."

Scott's primary problem was that he had developed a system (the planning process) for a group of users (his managers) without ever involving them in the design process. No one had analyzed the users' requirements; no one had tried to show them how a good plan would benefit them.

Fox's effort was put on the fast track, with design proceeding alongside development. The parallel activities were highly interdependent. Thus, the planning process should have emphasized identifying resource conflicts and deliverable dependencies.

The managers needed reliable milestones along a three- to four-month horizon to guide their conduct of day-to-day team activities. They needed a schedule-driven system that would provide early warning of possible slippages.

What they actually got was an elaborate time reporting system that reminded them of how far over budget they were.

Only acceptable standard

Producing quality systems — software that conforms to the specifications in every regard — should be the project manager's primary goal. When properly implemented, the project planning and control techniques practiced in other professions can help achieve this goal. The following are key features of these techniques:

- Identifying tasks in sufficient detail to support accurate estimates.
- Estimating based on directly comparable experience to identify the maximum probable cost of completing the project.
- Recognizing that specific resources, instead of tasks, must be scheduled.
- Applying performance measures that help identify problems early enough to facilitate appropriate corrective action.

Project managers must also adopt the philosophy that guides other project-oriented industries. The most important element of this philosophy is the belief that coming in on time, on budget and according to specification are the only acceptable standards of performance.

Managers must avoid the temptation to view project management as the latest entry in the cure-of-the-month club. More reliable plans and more accurate performance measurement are necessary conditions to ensure quality software, but even these are not sufficient. You still have to do everything else well, too. •

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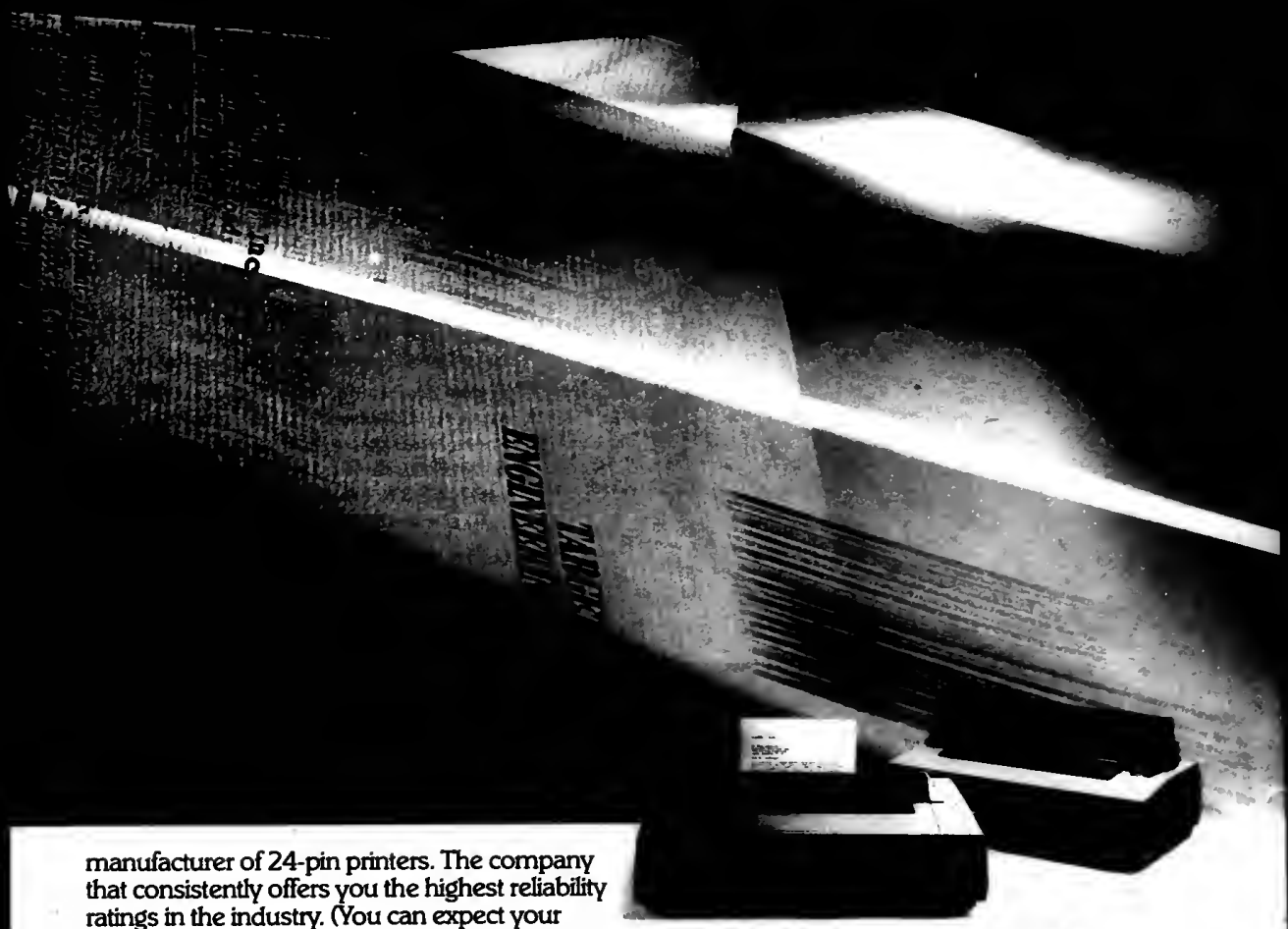

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Perhaps some of the ideas discussed below could prove helpful in getting what you deserve.

Appraisal of current conditions. Whether you believe you are satisfied or not, a complete appraisal of the quality and cost of each vendor's products and services is in order. An annual appraisal of all your vendors should not take much time but could prove to be time well spent.

Number of Vendors. The shops that use only one supplier could find themselves being taken for granted, since there is no competitive motivational factor present. If the vendor does not have to put forth a special effort to keep your business, then it will be inclined to give its

Continued on page 100

Time will relocate data center

BY JEAN S. BOZMAN
CW STAFF

CHICAGO — About half of the 110 members of the data center staff at Time, Inc.'s Magazine Group currently are expected to accept relocation to Tampa, Fla., where Time plans to move the facility, according to one of the center's managers.

Moving the workers is only part of the challenge facing the Magazine Group's director of information systems. He also will have to fill the other positions on the Tampa data center staff — more than 100 systems operators and technical support personnel and 70 to 80 systems analysts and programmers.

Last September, Time announced it would make the move and relocate data processing for its book division from the Chicago facility to Richmond, Va., taking a $50 million charge against its third-quarter earnings.

The moves are in step with a trend toward folding data processing operations into operating units and in keeping with a general Time strategy that advocates pushing toward decentralization.

Carl Gerami

They have been spurred by rapid growth in the Chicago center's work load that has run up against physical constraints. The book division's work is going to Richmond to be near its headquarters, while the magazine operations are moving to Tampa chiefly because of favorable construction and labor costs.

The moves are still in their initial stages, with relocation of the personnel, hiring of the new employees and selection of new buildings yet to be finalized, according to Carl Gerami, director of information systems for the Magazine Group, who spoke about that group's move in an interview.

In addition, a finished data facility must be prepared in Tampa and Time would have to air-condition one of several building shells now being evaluated for it, said Gerami. "We expect to be able to plug our machines into a finished building by the fall of this year," he said.

All large systems activities for magazine circulation — as well as most DP functions for Time's New York-based advertising and financial groups — will

Continued on page 106

Hiring AI pros can be tricky

BY ALAN J. RYAN
CW STAFF

A variety of factors are pushing the demand for artificial intelligence professionals both up and down, but AI specialists tend to remain scarce and expensive, according to experts in the field. Hiring them can call for innovative approaches.

Joan Gable, manager of data processing placement at the New York office of recruiter Robert Half International, Inc., says she currently sees little demand for AI specialists. "Scientific and medical firms are doing development in AI, but we haven't seen much of it here," she says.

But others say that the demand for AI specialists, while not great, is on the rise. "There's more activity going on in [AI] than before," says Ronald LeBleu, managing partner at Software People Concepts, Inc. in New Haven, Conn. "More people have become interested in it and are beginning to find out what it's about," LeBleu says. Major insurance companies and computer manufacturers are among those hiring AI specialists, he adds.

Popular applications of AI include expert systems, easing the use of end-user programs, computer-integrated manufacturing, robotics and voice I/O, consultants claim.

"Because factories are trying to meet European and Japanese competition, they feel they have to be more efficient," says Daryl Furno, vice-president of the placement firm Halbrecht Associates, Inc. in Stamford, Conn. "The leading edge is computers.

Continued on page 108

BOOK REVIEWS

Probing end-user computing

Managing End-User Computing in Information Organizations
By William H. Inmon

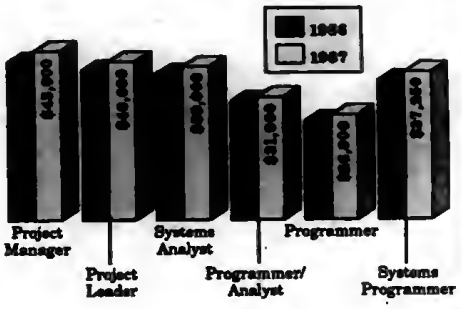
When you consider all the areas that end-user computing affects — not just reporting or decision-support capabilities but also budgeting, computing priorities and the organizational structure itself — then "managing" may not seem like a doable task.

But in fact, because end users have whittled down data processing's duties, taking over the

Continued on page 104

Data View

MIS salaries
Average salaries for systems and programming and for technical services positions for large-scale installations



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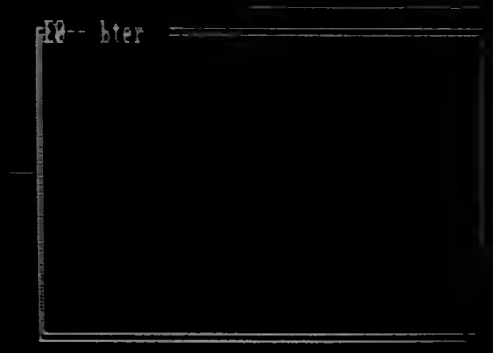
UPDATE INFORMATICS



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Managing

CONTINUED FROM PAGE 97

attention to others.

Recognize that the vendor has a limited budget and staff, just as you do, and must choose the priorities for the time invested. The other extreme is a shop that uses so many different vendors that no one vendor can justify a significant investment of time to become a partner in achieving goals. Look at it from the vendor's perspective. There must be a reasonable chance of a return on the vendor's investment.

Somewhere between these two extremes is the right arrangement, which allows you to get the most from your vendors. Many managers will tend toward dealing with fewer vendors in order to keep their computer systems compatible and minimize the knowledge base required. This allows the vendor to justify a greater investment on your behalf. It will also give you a bigger stick to use in getting the service you expect.

Choosing your vendors. Perhaps you are involved in selecting a vendor right now. How can you make the correct selection in order to avoid the kind of problems I am discussing? Of course, the product or service must meet your needs and the cost must be feasible. But is cheapest always best? Maybe you should consider the vendor's stability, to have some assurance that the support and future growth path will be there when you need them.

Another suggestion is to talk with other users. The vendor will, of course, want you to talk only with satisfied users. Use sources within your own industry, to be sure you are talking with objective users who will be honest.

Vendor responsibility. A mistake made by many companies is to rely too much on vendor representatives. Perhaps you know of companies that engaged a vendor to conduct a study and recommend a solution, which just happened to include the vendor's own products. Then the result proved less than satisfactory because there was a lack of knowledge and commitment on the part of the companies' own employees.

Use the vendor's representatives wisely but don't turn your business over to them.

Contracts vs. promises. Another area of potential trouble is in the lack of attention to formal contractual arrangements.

Your agreement with a vendor should be viewed as a formal relationship between two business entities. There is a chance that either you or the vendor representative, or both, will not be around for the duration of the use of the products. Are all the vital elements of the agreement included in the contract, or are there some handshake deals that could be easily broken?

Using an attorney to prepare the contract or advise you on its contents is a safeguard that could save you money and/or despair down the road. Also, the use of requests for proposals and formal bids from vendors creates a written commitment on the part of the vendor that will help assure its compliance.

Commitment and support. The MIS director should have realistic expectations of what the vendor can and should provide. You have the right to expect honest, professional, best-effort service from vendor representatives. But it is not realistic to expect perfection or an immediate comprehensive response to all situations.

Sometimes you may have to request a change in vendor representatives. If so, be prepared with the facts to substantiate unacceptable performance that must be corrected.

A MISTAKE made by many companies is to rely too much on vendor representatives.

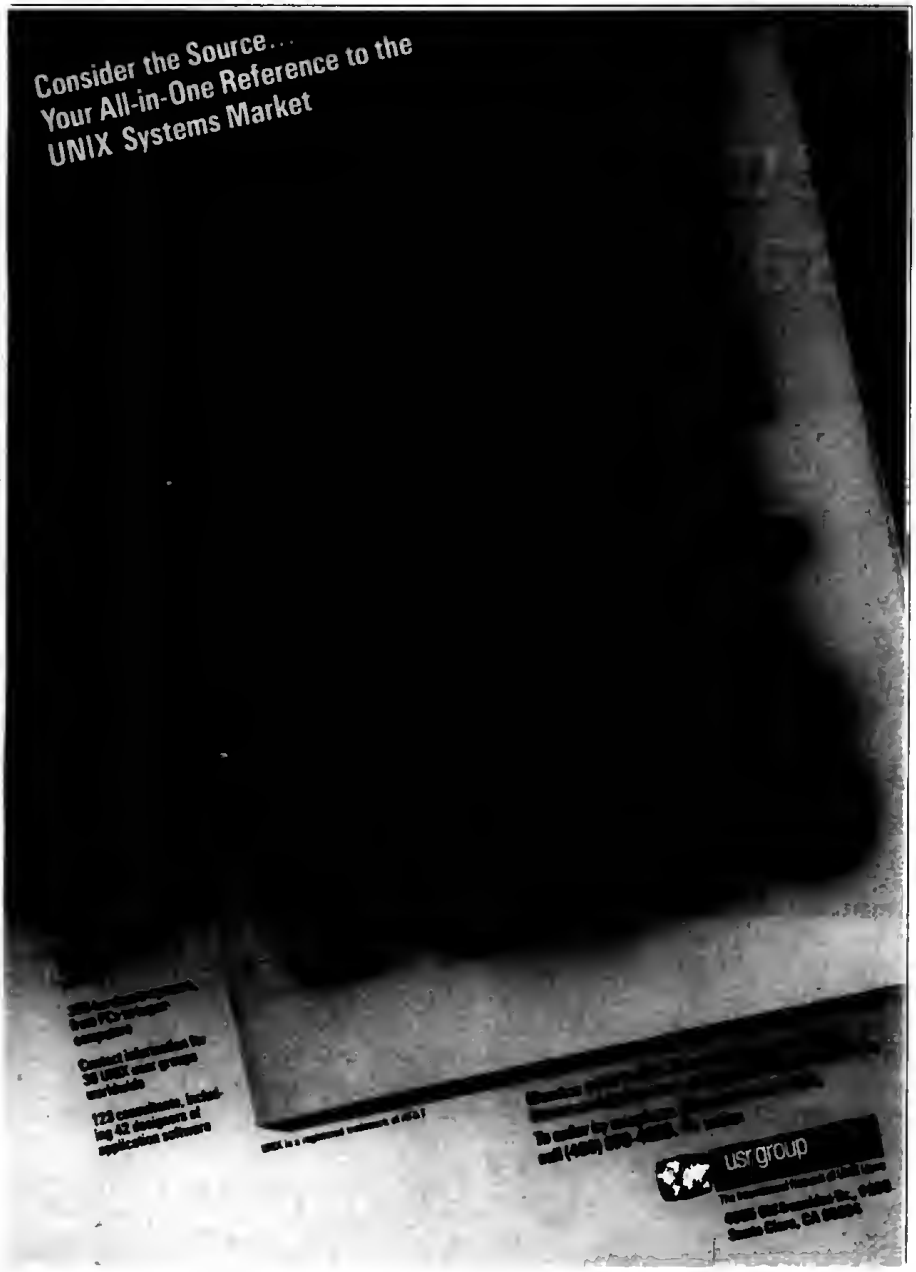
Multiple vendor situations. One of the most common difficulties in vendor relations is caused by the multiple vendor controversy. This is especially acute these days in the telecommunications area. Whether at installation time or problem-resolution time, finger pointing can easily occur. How do you deal with this situation?

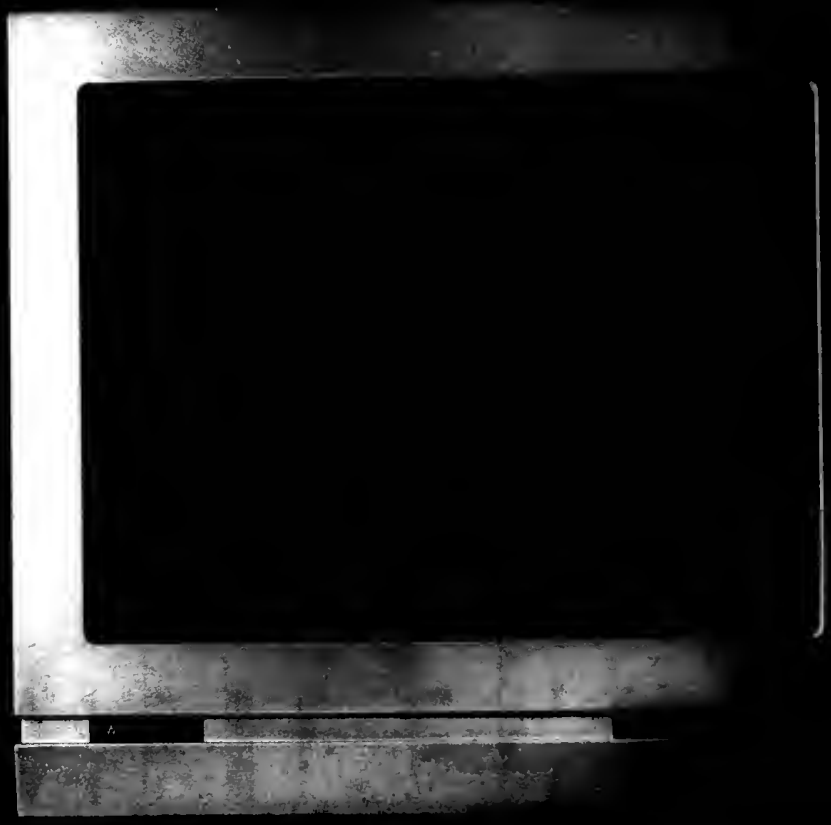
A carefully worded contract will help. Dealing with vendor representatives who want a successful long-term relationship will certainly prove valuable. Demanding cooperation from all the vendors involved will be a necessity.

I contend that there is someone up the ladder in each vendor company who wants his company's part of the puzzle to work properly. Upper management of vendor companies does not like to bear complaints and does not like embarrassing stories to be made public. The MIS director must often escalate the problem to a high level before vendor representatives will give full cooperation.

It is my judgment that this lack of complete cooperation in a multiple-vendor situation is one of the most critical problems in our industry today. Those vendors, whether computer or telecommunications, that do not recognize the problem and adopt a policy of cooperation will eventually pay for it.

Gilliam is an independent computer and management consultant based in Ponca City, Okla. with more than 30 years experience in data processing.





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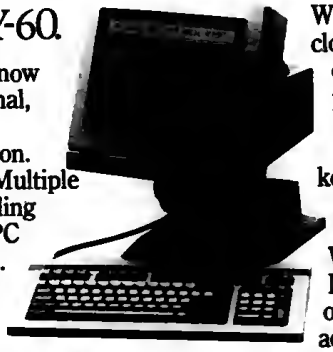

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Probing

CONTINUED FROM PAGE 97

tasks of specifying hardware and software and even developing custom programs with fourth-generation languages, then the only major task left to DP, argues the author, is to provide data.

Managing End-User Computing in Information Organizations outlines some fundamental differences between end-user computing and traditional data processing — data usage, level of detail, types of processing and so on. But the book goes much farther, examining the implications of end-user computing's need for effectiveness rather than efficiency, for example, and probing the limitations of a technology that was developed to serve traditional DP.

The author, a consultant and senior principal with American Management Systems, Inc., does spend some time on basic technology. Chapter Two instructs the reader about the necessary elements of end-user computing: hardware, software, communications, cabling, licenses, installation, training — even scheduling and data definitions.

But the weight of the text provides perspective. Chapter Three describes a company reaching a crisis point when "upper management became dissatisfied with the decision-support process because different people, using the same data, arrived at very different conclusions." This all-too-familiar crisis forces any company to make one of two choices: let business take its course, which will mean one department will gain credibility at the expense of all the others, or step in and insist on organizational discipline.

Here the task of merely providing data takes on real importance. Inmon argues that the mandate of organizational structure lies in the controlled "architected" use of data. He maintains that the high-level corporate data model must be identical to that used by end users. Otherwise, he writes, "There will predictably be *major* problems with the corporate information systems."

In later chapters, the author turns to the how-to's of constructing a sound DSS architecture. He seizes on some sensible but widely misunderstood principles of data extracting, which he blames for many of the inconsistencies that plague companies: "When an extract of an operational data base is done at 10 a.m., it is not surprising that the extract produces different results from one done at 4 p.m., since the operational data base is constantly being updated. . ."

Instead of simple extraction, Chapter Seven proposes a three-tiered extraction scheme, with each level a subset of the previous one — and therefore consistent.

Throughout, one of the strengths of Inmon's book lies in the specifics he provides: measures for figuring your success, equations for determining which application should be developed by DP and which should be developed by end users via fourth-generation languages.

But in trying to cover so much ground — from computing basics to the intricacies of data architecture — the author stumbles on the issue of who he addresses in his pages. If readers understand data extraction, will they need to be taught the difference between a token-ring and a star network topology?

The reader's best bet: Bypass the rather inaccessible table of contents. Instead, use the clear introductions and summaries at the beginning and end of each chapter to find appropriate sections and skip the others.

No reader should miss the author's parting shot to DP: "If the DP department is still in the early stages of control, then it is unlikely that the end user can evolve much further."

Hardcover, $30, 216 pages, ISBN 0-87094-941-1, by Dow Jones-Irwin, Homewood, Ill.

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By Jerome Garfunkel
A definitive guide to the new Cobol 85 language written from an insider's perspective by one who is intimately involved with its development.
Paperback, $24.95, 322 pages, ISBN 0-471-80461-4, by John Wiley & Sons, Inc., New York, N.Y.

The Pick Operating System
By Joseph St. John Bate and Mike Wyatt
A complement to the Pick manual, particularly useful to users wishing to develop their own systems.
Paperback, $24.95, 150 pages, ISBN 0-442-29276-7, by Van Nostrand Reinhold Co., New York, N.Y.

How to Use CICS to Create On-Line Applications
By Boris Musteata
Methods and solutions for understanding and working in the CICS environment from an applications point of view.
Paperback, $39.50, 525 pages, ISBN 0-89435-182-6, by QED Information Sciences, Inc., Wellesley, Mass.

Business Software Directory
Edited by Ruth Koolish
The third edition of this two-volume set includes 7,800 listings for micro and minicomputer software as well as for mainframe software that links to micros and minis.
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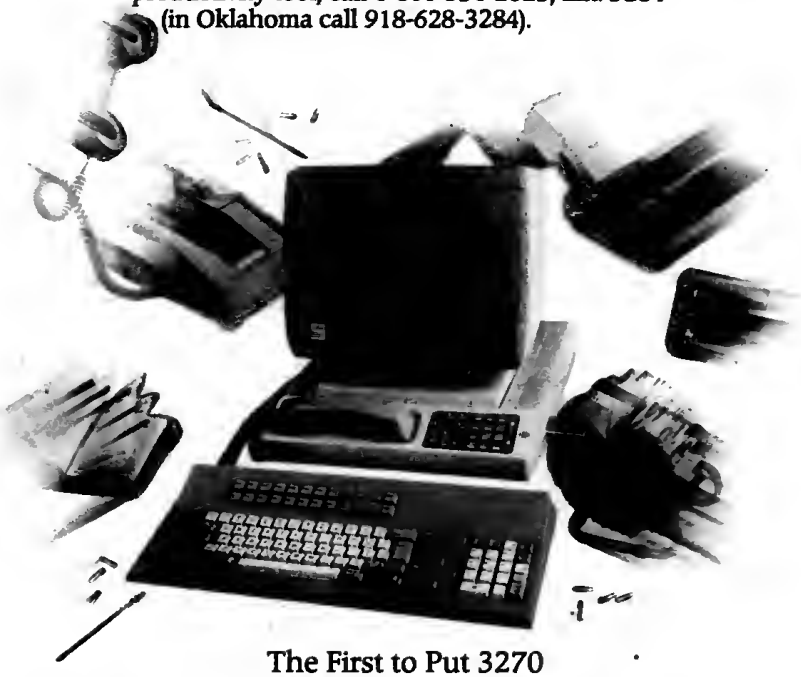

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Time

CONTINUED FROM PAGE 97

be moved to Tampa by the end of 1988, Gerami said. The new data center will be part of a newly named Time subsidiary, called Time Customer Service, Inc.

The computer room will be anchored by one or more IBM 3090-class machines, although they have yet to be purchased or leased. MIS managers are also evaluating new office system computers, as well as optical scanning equipment for data entry and high-speed laser printers for promotional materials.

For the moment, circulation fulfillment for the Magazine Group, which tracks 12 million customer accounts, will continue from a data center in the Chicago Time-Life Building. The Chicago center houses an IBM 3084 and a 3090, but the machines there will be downsized once the move is complete, Gerami said.

The Chicago computers handle circulation lists for *Time, Sports Illustrated, Life, People, Discover, Fortune* and *Money* magazines, as well as *Time Canada*, the Canadian version of *Time*. The computers also run statistical analyses of supermarket buying patterns for Time's Selling Areas Marketing, Inc. unit, a function that will remain in Chicago.

Processing requirements are expected to be somewhat different in Tampa, which is not threatened by snowstorms but suffers from more variations in power supply due to occasional lightning strikes. For this reason, the company is considering the installation of both uninterruptible power supply (UPS) systems and auxiliary generators. "In Chicago, we've always run without a UPS system, and we've never had a problem, but most DP shops in the Tampa area are installing UPS systems," Gerami said.

Time's move to Tampa will result in the employment of 1,200 people in three facilities there, housed in a single 100,000-sq ft building.

The Tampa area has seen the addition of several key corporate MIS shops in recent years, including the National Administrative Center of Price Waterhouse, IBM's 1,400-employee Information Network facility, GTE Corp.'s Data Services and a Citicorp operation.

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PC-CW

NCC moves to avert slump in exhibitors

BY DAVID A. LUDLUM
CW STAFF

Managers of the National Computer Conference (NCC) have orchestrated several moves aimed at reviving the show, but any changes appear unlikely to forestall considerable shrinkage in the number of exhibitors this year.

NCC management has abandoned Las Vegas as a conference site and scheduled future shows in major marketplaces — New York, Chicago and the Los Angeles area. It also has slated conferences after next year's for dates earlier in the year — April rather than June.

The managers have chartered two advisory committees — one representing the trade press and the other industry vendors — and designed 10 conference program tracks aimed at guiding this year's attendees to educational sessions and product exhibits.

NCC has suffered from the computer industry slump of the past two years and also from inroads made by more narrowly focused shows and ones geared to microcomputer technology.

In a recent meeting with *Computerworld* editors, Rolland Arndt, chairman of the NCC board of directors, suggested that the Interface Group, Inc.'s microcomputer-oriented Comdex show has been a major factor in NCC's decline. "We were somewhat slow to recognize the importance of personal computers," Arndt said.

Insufficient focus?

The lack of exhibits from Digital Equipment Corp. and Apple Computer, Inc., which put on their own conferences, have been thorns in the side of NCC, added Arndt, a former Unisys Corp. executive. The conference has also been hurt by perceptions that it is not sufficiently focused and does not emphasize software, Arndt said. He also acknowledged that the NCC bureaucracy became top-heavy and sluggish but added that such issues have been addressed. "We have cleaned up our act and are ready to go forward again," he said. The NCC board has hired a conference management consultant and is moving toward hiring a marketing or public relations agency, Arndt observed. It has also attracted a growing number of foreign attendees, primarily Japanese, with help from a U.S. Department of Commerce program.

However, commitments from exhibitors foreshadow continued decline for NCC when the show is held in Chicago's McCormick Place June 15 to 18.

Late last month, when a high percentage of the final total was expected to be signed on, only about 150 vendors planned to exhibit, according to marketing director Marty Byrne. That compares with 360 exhibitors in Las Vegas last year, about 425 in Chicago in 1985 and more than 700 in Las Vegas in 1984.

The number of people attending the exhibits and educational sessions rose from about 65,000 in 1984 to 85,000 in 1985, according to Byrne, but fell to about 45,000 last year, she said.

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Hiring AI pros

CONTINUED FROM PAGE 97

If AI can help with that, then they need to use all of that technology too."

On the supply side, availability of AI specialists is affected by employment at vendor companies, and many that were started in recent years have slowed or frozen hiring or even laid off workers, Furno notes. "The few that got started are presently gearing down so they can be profitable," she says.

But some start-ups take the place of those that shrink or close, Furno adds. "There is always the latest thing . . . In this case, it is mostly parallel processing and neural networks." These may call for different skills than traditional AI start-ups, she comments.

Meanwhile, the young age of the artificial intelligence field continues to restrict the supply of specialists. "There aren't any knowledgeable chiefs and not too many knowledgeable Indians," says Hershel Waldner, president of American Data Search & Management Consultants in New York. One or two years in the field means a worker is a veteran, he adds.

"The whole field of AI is very entry level . . . It's just not an established field," Gable says. Those who do have experience often got it through schools or other research institutes, she claims.

With about 16,000 AI specialists in the U.S. — excluding academics — and most of them working in expert systems, many companies have had trouble finding workers sufficiently experienced or whom they can bring up to speed, LeBleu asserts. If they do, they are often aghast at the specialists' hefty salaries — perhaps in the mid-$50,000 range with little more than a year's experience.

Waldner claims companies often solicit his firm to find an AI professional with three years of experience who will work for $35,000. "They don't realize that there is a law of supply and demand . . . and they don't know how to price out these people," he says.

Waldner advises companies to think through the process carefully. Rather than trying to play catch-up with a competitor, a company should first work with a strategic planner to see if it needs or really wants an AI unit. "This way, they don't spend all kinds of money doing [AI] when they don't want it," Waldner says.

He suggests employers ask themselves, What kind of people are out there? What are we willing to pay for AI? What can we expect from the AI professional? What should we look for? Can we hire someone working in a similar environment if nobody is available from our type of firm?

When seeking the AI professional, traditional pay scales based on experience and education sometimes have to be discarded, consultants note. But in some companies, strict rules prohibit the altering of those requirements.

"Even if you are the most brilliant AI person in the world, if you don't fit the formula to be making $60,000, they won't pay it to you," Furno says. These companies might have to hire people with less-than-required or no specialized experience.

Some companies have worked around such restrictions by hiring consultants at rates higher than they are allowed to pay employees, although the expense can be even greater than the going rate to hire an AI specialist as an employee, Furno comments.

Roger Sobkowiak, president of Software People Concepts, Inc. in New Haven, said most companies can realize significant near-term payoffs from AI by training employees and using conventional equipment.

LeBleu agrees. "Because it's a new field, I think there's a bit of mythology," he says. "I think a good systems person can be converted to [an AI specialist] within a short period of time with the proper guidance."

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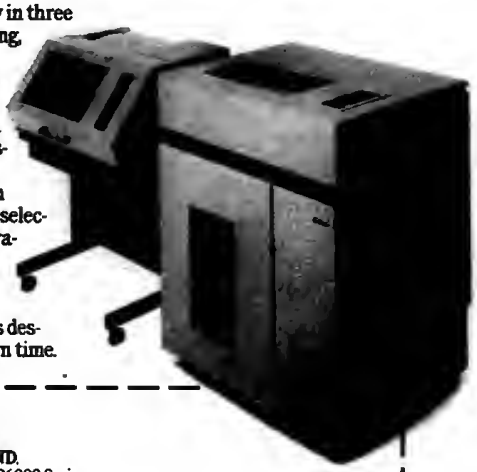

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Guide International. Anaheim, Calif., March 15-20 — Contact: Guide Headquarters, 111 E. Wacker Drive, Chicago, Ill. 60601.

Software Quality Assurance. Los Angeles, March 16-17 — Contact: U.S. Professional Development Institute, Suite 221, 1734 Elton Road, Silver Spring, Md. 20903. Also being held March 23-24 in Washington, D.C., and March 30-31 in Chicago.

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1987 West Coast Manufacturing, Accounting and Production Infor-

Continued on page 110

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UNISYS

The power of 2

Continued from page 108

mation Control System Users Conference. San Diego, March 16-17 — Contact: Salem Corp., 1654 Poplar Lane, Annapolis, Md. 21401.

Artificial Intelligence and Expert Systems. Cleveland, March 16-17 — Contact: Association for Systems Management, 24587 Bagley Road, Cleveland, Ohio 44138. Also being held in Louisville, Ky.; Dayton, Ohio; Portland, Ore.; Fort Worth, Texas; Baltimore; Richmond, Va.; Concord, Calif.; Tulsa, Okla.; St. Paul, Minn.; Cincinnati; and Toronto.

Fifth National Conference on Measuring Data Processing Quality and Productivity. Orlando, Fla., March 16-18 — Contact: Quality Assurance Institute, 9222 Bay Point Drive, Orlando, Fla. 32819.

National Conference on Ada Technology/Washington Ada Symposium. Arlington, Va., March 16-19 — Contact: GTE Government Systems, 77 A St., Needham Heights, Mass. 02194.

Electronic Data Processing Audit Managers' Roundup III. Orlando, Fla., March 16-19 — Contact: MIS Training Institute, 4 Brewster Road, Framingham, Mass. 01701.

TCP/IP Interoperability Conference. Monterey, Calif., March 16-19 — Contact: Advanced Computing Environments, 21370 Vai Ave., Cupertino, Calif. 95014.

Tutorial Week. Kissimmee, Fla., March 16-20 — Contact: Computer Society of IEEE, 1730 Massachusetts Ave. N.W., Washington, D.C. 20036.

Open Systems Interconnection. Washington, D.C., March 16-20 — Contact: The Omnicom Institute, Omnicom, Inc., 501 Church St. NE, Vienna, Va. 22180. Also being held April 27-May 1 in Minneapolis.

Workshop on Factory Communications. Gaithersburg, Md., March 17-18 — Contact: B217 Technology Building, National Bureau of Standards, Gaithersburg, Md. 20899.

Fifth Technology Opportunity Conference on Optical Storage of Documents and Images. Washington, D.C., March 17-19 — Contact: Rothchild Consultants, 256 Laguna Honda Blvd., San Francisco, Calif. 94116.

The National Association of Bank Servicers Semiannual Meeting. Tampa, Fla., March 17-20 — Contact: National Association of Bank Servicers, Suite B, 5008 Pine Creek Drive, Westerville, Ohio 43081.

The International Phoenix User Group Meeting. Atlanta, March 18-19 — Contact: Livingston and Associates, P.O. Box 30619, Cleveland, Ohio 44130.

Testing Computer Software. Los Angeles, March 18-20 — Contact: U.S. Professional Development Institute, Suite 221, 1734 Elton Road, Silver Spring, Md. 20903. Also being held March 25-27 in Washington, D.C.

1987 Template User Network Annual Conference. Arlington, Va., March 18-20 — Contact: Template, 9645 Scranton Road, San Diego, Calif. 92121.

Innovative Systems 1987 User Group Conference. San Francisco, March 18-20 — Contact: Innovative Systems, Inc., 341 Fourth Ave., Pittsburgh, Pa. 15222.

MARCH 22-28

Electronic Computing Health Oriented (ECHO). Hot Springs, Va., March 22-25 — Contact: Electronic Computing Health Oriented, 10401 Fernwood Road, Bethesda, Md. 20034.

Computer Graphics '87: Applications for Excellence. Philadelphia, March 22-26 — Contact: National Computer Graphics Association, Suite 200, 2722 Merrilee Drive, Fairfax, Va. 22031.

Managing the Information Resource. Los Angeles, March 22-27 — Contact: Nolan, Norton & Co., One Cranberry Hill, Lexington, Mass. 02173.

Sixth Annual International Spectrum U.S.A. '87. Las Vegas, March 23-25 — Contact: International Data Base Management Association, Suite 104, 9740 Appaloosa Road, San Diego, Calif. 92131.

Strategic Data and Systems Planning '87. Arlington, Va., March 23-25 — Contact: Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

National Capacity Planning Conference. Washington, D.C., March 23-26 — Contact: National Capacity Planning Conference, 3825-I S. George Mason Drive, Falls Church, Va. 22041.

Walker Inter/Actions Users Conference. Denver, March 23-26 — Contact: Walker Interactive Products, 100 Spear St., San Francisco, Calif. 94105.

Datacon '87. St. Louis, March 24-25 — Contact: Datacon, P.O. Box 1401, St. Louis, Mo. 63188.

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T1 takeovers tempt IBM

Some manufacturers of very high-speed data communications equipment have been wondering who among them might end up as the next IBM acquisition or subsidiary.

The issue centers around IBM's strategic need to offer its mainframe clients the ability to use T1 transmission channels that are available from major communications carriers. These are basically private data-transmission links capable of operating at speeds of 1.544M bit/sec. in North America and more than 2M bit/sec. internationally.

Since the breakup of AT&T, large corporate users have been increasingly moving to set up their own T1 networks to take advantage of this technology.

The market for T1 equipment was estimated to have doubled in 1986 to reach $250 million. It is now being forecast to increase by at least 60% this year and is expected to hit the $1 billion mark within the next few years.

This means venture capital is flowing, new start-ups are entering the fray, and even staid old IBM is finally taking notice of the market.

Piquing interest

At first blush, it would appear that IBM could easily build its own T1 network equipment through its Rolm Corp. subsidiary. On the other hand, the market so far has been too small to interest Big Blue, which has left the field open for several start-ups and traditional multiplexer firms.

But with IBM now showing interest, existing T1 equipment makers have good reason to believe that IBM may be on the prowl to acquire one of them, or strike a deal to sell their products under an IBM logo.

One of the reasons is Stratacom, a 1986 start-up specifically targeting T1 equipment and network management markets.

Continued on page 119

Firm strives to regain strength

BY JAMES A. MARTIN
CW STAFF

SAN ANTONIO — Although Datapoint Corp. offers what is largely considered a solid line of office automatioo and communications equipment, the company'a misfortune in recent years has created an increasingly negative image that haa been a significant factor in Datapoint's continued decline, insiders said.

In addition to a recent $65.9 million second-quarter net loss and the reduction of 786 jobs worldwide, the company has experienced a variety of scandals, setbacks and unpleasant surprises in the past few years that would overwhelm almost any corporate reputation.

Datapoint reported operating losses in 1985 and 1986, suffered lawsuits that alleged it misrepresented financial results, has been slow to introduce new technologies and cut its worldwide work force from 8,822 in 1982 to 2,695 following the recent layoffs.

There has also been a highly publicized takeover and leveraged buy-out attempt by well-known Wall Street financier Asher B. Edelman. More recently, 13-year Datapoint executive and Chief Executive Officer Edward P. Gistaro resigned suddenly and without explanation [CW, Jan. 26]. Gistaro could not be reached for comment last week.

As a result of these developments, potential Datapoint customers and the firm'a installed base have heard only the bad news about the company lately, observers said.

"They definitely have a very negative image that will be difficult to overcome," said Gwen Peterson, vice-president of computer products research at Dataquest, Inc. in San Jose, Calif.

One measure of its sagging reputation is the lack of Wall Street analysts following Datapoint. This year's edition of *Nelson's Wall Street Research*, a comprehensive listing of analysts, lists only five who watch Datapoint. However, none of those reached by *Computerworld* said they have continued to pay attention to the company.

Continued on page 116

IBM combines forces with Sterling

BY CLINTON WILDER
CW STAFF

DALLAS — In another move to strengthen its position in the banking market through independent software vendor partnerships, IBM has announced a complementary marketing agreement with Sterling Software, Inc.'a financial software group.

Under the agreement, the companies will combine the marketing of IBM'a Check Processing Control System (CPCS) and hardware with Sterling'a CPCS installation services and specific check-processing applications software. The pact is IBM'a most recent under its Industry Marketing Assistance Program.

The deal is also IBM'a third significant banking software vendor partnership within the past year. After last year'a controversial OEM deal with Hogan Systems, Inc., IBM is the exclusive U.S. marketer of Hogan's mainframe banking applications.

IBM also sells Software Services of America, Inc.'a teller terminal networking software through its Commercial Systems Integrator program [CW, Sept. 15, 1986].

Sterling has never competed directly with IBM in check-processing software, according to Larry Fournier, vice-president of marketing for Sterling'a financial software unit.

Fournier added that the IBM agreement will give Sterling more access to accounts at the beginning of a buy decision, rather than after a customer has already licensed an IBM CPCS, he said.

Ashton-Tate gears up for acquisitions

BY ALAN J. RYAN
CW STAFF

TORRANCE, Calif. — Ashton-Tate, shortly after reporting its strongest fiscal year to date with revenue of $210 million, announced plans to sell two million shares of its common stock. Company watchers say Ashton-Tate is gearing up to acquire other firms with the additional funds.

Last week, Ashton-Tate said it plana to file a registration statement with the Securities and Exchange Commission within the next 30 days covering the public offering of the stock.

At current stock prices, which are hovering around $25 per share, the sale should net the company slightly more than $50 million, analysts said. The company said it will use the funds as working capital and for other general corporate purposes, including the possible acquisition of other businesses or

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- Electronics trade deficit rises. Page 117.
- HP keeps operations in South Africa. Page 119.

CAD/CAM vendors shifting focus

Computervision, Intergraph rolling out engineering workstation tools

BY ROSEMARY HAMILTON
CW STAFF

Faced with declining demand for large turnkey systems, the two largest computer-aided design and manufacturing (CAD/CAM) vendors have been implementing bold changes during the past few years. But while the strategies of Computervision Corp. and Intergraph Corp. appear similar on the surface, they have many fundamental differences.

Both vendors no longer associate themselves solely with their minicomputer offerings, as is evidenced by the engineering workstation products they have been rolling out for more than a year. But the vendors also appear to be putting their proverbial eggs in different baskets.

Computervision is playing up its successful Cadds 4X software and is now calling it the company'a flagship product. Meanwhile, Intergraph is focusing on its hardware capabilities and is mapping out plans that center on its workstation platform.

"They've taken different approaches, and, on the surface, Computervision'a is easier to swallow," saya Laura Conigliaro, a vice-president at Prudential-Bache Securities.

Computervision has recently begun a slow recovery from a disastrous 1985, a year in which it reported a whopping net loss of $80.8 million. In addition to its financial setback, Computervision lost the No. 1 CAD/CAM market share position to IBM. Intergraph, meanwhile, which had been keeping up steady growth, took the No. 2 slot, pushing Computervision to No. 3.

Bedford, Mass.-based Computervision'a troubles were attributed primarily to its proprietary minicomputer systems, which were losing appeal in a market that wanted 32-bit workstations that supported industry standards.

Acknowledging that Cadds 4X software was its trump card, Computervision opted to port it to a system based on a workstation from another vendor, Sun Microsystems, Inc.

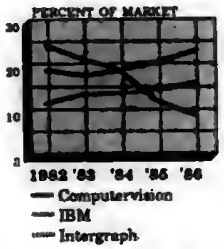
The move was hailed by analysts and users alike, and although Computervision will not release specific sales information, Caddstation has clearly contributed to improvements on Computervision'a balance sheet.

Buried within this strategy, however, is what analysts say is a major flaw that could eventually harm the vendor. Caddstation is sold as a bundled system only, and the vendor'a unwillingness to make Cadds 4X software

Continued on page 120

Contrasting fortunes

Five-year CAD/CAM market share history



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FROM PAGE 113

"They simply are no longer a force in the business," said one analyst, who asked not to be identified. Another said that Edelman's takeover caused most analysts who still covered Datapoint to lose interest. The second analyst, who also requested anonymity, explained that, "when a company becomes an arbitrage stock, the value of it becomes determined by the arbitrageur and not the market."

Aside from its troubled reputation, however, Datapoint offers a strong product line that allows the interconnection of disparate office automation operating systems, a problem most of corporate America is tired of grappling with, according to Andrea Rossi, analyst with Rossi Consultants in Marblehead, Mass.

"We need someone out there who can integrate office automation systems, and they have the products," she said.

Datapoint's return to profitability will be a long haul, but the company's strategy of focusing itself as an office automation interconnect vendor, cutting costs and increasing marketing efforts is the right one, according to Peterson.

"The underlying theme today in Datapoint's product line is the ability to take diverse operating environments and allow them to share data through the Arcnet [Datapoint's proprietary local-area network]," Peterson said. "That approach is what is needed today."

The troubled communications and office automation vendor recently reported a quarterly net loss of $65.9 million, or $5.02 a share, compared with a loss of $6.5 million, or 37 cents per share, for the year-earlier period. Revenue fell 6.8% to $74.3 million, compared with $79.8 million a year ago.

Datapoint's elimination of 786 jobs worldwide reduced its domestic work force by 37% and its international force by 13%. Those positions were scattered throughout the company, a spokesman said.

The net loss of $65.9 million included special charges of $56.8 million as a result of Datapoint's efforts at corporate realignment. Those charges include $13 million in severance packages for fired employees, $12 million in write-downs on the value of unsold products, $6.4 million for early termination of office leases and $25.4 million related to the write-down on fixed assets such as office equipment.

Although Datapoint's domestic sales force was cut from 200 to 116, the company has added several key executives in that area to direct its public image and sales force.

Ron Meyers, Datapoint's director of international marketing for the Americas and the Far East, has been appointed senior vice-president of marketing and sales. Insiders said they believe Meyers' position is a strategic one, as Datapoint has not had anyone in that capacity for more than one year and sorely needed that position filled.

In addition, F. Terry Eger, formerly the Los Angeles district director for Wang Laboratories, Inc., has been hired to fill the newly created position of vice-president of domestic sales. In another key appointment, James Behan has been named vice-president of worldwide product marketing.

As previously announced, Doris Bencsik, the company's highly regarded chief operating officer, continues to replace Gistaro on an interim basis until a CEO is selected. Many insiders said they believe Bencsik would make a good Datapoint CEO, with previous experience as director of engineering for Data General Corp.'s small-business systems division.

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Feds seize illegal MS-DOS copies

BY DOUGLAS BARNEY
CW STAFF

REDMOND, Wash. — Microsoft Corp. has announced that federal agents recently seized 15,000 copies of a Taiwan-developed operating system that are allegedly illegal copies of Microsoft MS-DOS.

Microsoft obtained a temporary restraining order against Wetex International and California-based Quadrant Corp., firms allegedly involved in the importing and distribution of Falcon MS-DOS. The restraining order prevents them from infringing on Microsoft's copyright.

Few details of the case have been released.

"All we know is that a company in Taiwan was shipping 15,000 copies of what is called Falcon MS-DOS to the designated receiving party, Wetex, and apparently was to be shipped by Wetex as agent to Quadrant," said Microsoft corporate attorney William T. Poke.

"The sample that we have taken a look at indicates that in all cases, at least 50% is copied Microsoft MS-DOS code," Poke added.

No charges have been filed against Wetex or Quadrant.

Poke said the company in Taiwan that is shown as the shipper on the bill of lading is called Favorlon.

He added that Microsoft still does not know with certainty what firm manufactured the product in Taiwan.

When seized, the shipment had already made it through U.S. customs. Microsoft was unsure whether the packages were intended to be sold individually or bundled with personal computers.

According to Microsoft, the shipment seized was not the first to reach the U.S.

"We are aware of a product that is called Falcon MS-DOS being distributed to a limited extent in the U.S. We are also aware that a product by the same name — we don't know if they are identical — has been distributed in the Far East, certainly in Taiwan," Poke said.

The seizure was made in mid-February, according to officials.

Electronics deficit up

BY JAMES A. MARTIN
CW STAFF

PALO ALTO, Calif. — Worries about the U.S. trade imbalance were heightened recently by a report from the American Electronics Association that estimated the U.S. worldwide trade deficit for electronics increased 49% in 1986.

The U.S. electronics trade deficit with Japan, a major subject of concern in the semiconductor and computer industries, was $20.4 billion, an increase of 17% above the 1985 deficit of $17.5 billion, the association reported.

The U.S. trade balance with the world was negative for most industry segments. It was only positive for computers and office products. Even so, the positive balance in those two segments dropped 50% and 13%, respectively.

AEA President J. Richard Iverson called the accelerating growth rate of the worldwide trade deficit "alarming." He attributed the rate to the "strong push" by Pacific Rim countries other than Japan into the U.S.

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HP to stay in S. Africa

BY JAMES A. MARTIN
CW STAFF

CUPERTINO, Calif. — Although IBM, AT&T, Honeywell, Inc. and others have recently made highly publicized departures from South Africa, Hewlett-Packard Co. has voted in favor of the company retaining its sales operations in Johannesburg.

At the Palo Alto, Calif.-based company's annual meeting, a shareholder proposal that HP "expeditiously withdraw" from South Africa was soundly defeated. Some 175 million shares were cast to oppose the proposal, with only 20 million shares voting in favor.

"Hewlett-Packard continues to believe in our presence there," said William Hewlett, a co-founder of the company and retiring vice-chairman of the board. "We feel we can best confront apartheid by remaining in South Africa, and we are committed to confronting it with action."

Companies restricted

But U.S. corporations are "severely restricted in what they can do in South Africa," said Albert J. Wilson, associate general counsel of Teachers Insurance and Annuity Association of America, a New York-based equities fund concern that owns more than three million HP shares.

HP's belief that it can affect changes in the racist government is "naive at best," Wilson said. "U.S. companies have not been able to make any changes there, and there's no indication that South Africa is prepared to dismantle apartheid," he said.

Rather than making progress, HP's continued presence in South Africa will indirectly support the racist regime, Wilson said. "The company's products are crucial to South Africa, and HP has no control over the final use of those products by the government or the police in the apartheid system. Also, HP can be forced to sell their products to them as long as they're in South Africa, and all of this can be done in secrecy as well."

Analyst David Wu, of San Francisco-based S.G. Warburg & Co., said he agreed with the shareholders' vote. "Commercial organizations are not important enough to affect any political policies of a country," Wu said. "If Hewlett-Packard were to withdraw, it wouldn't bring apartheid down."

Wilson said his investment company would not divest itself of HP stock but would continue its efforts to convince the company to withdraw from the politically troubled nation. Hewlett said that due to the number of shares in favor of the proposal to withdraw, the proposal could be entertained again at the 1988 shareholder's meeting.

HP's operations in South Africa are strictly sales-related, according to the company. The South Africa sales force generated some $37 million in fiscal 1986 revenue. Although several major computer vendors have withdrawn from South Africa, they have often done so after previous shareholder resolutions failed. IBM announced its pull-out decision late last year, but in April, its shareholders had overwhelmingly rejected a proposal to withdraw.

T1 takeovers

CONTINUED FROM PAGE 113

Significantly, this venture was started by ex-Rolm executives who left after the IBM acquisition. Their departure may have deprived IBM of its most creative T1 designers — who have since received more than $11 million from leading venture capital firms, and have announced with unusual confidence that they expect to capture at least 15% of the T1 equipment market in the next few years. Thus IBM may not have the advantage it thought it had when it acquired Rolm two years ago.

Network Equipment Technologies is another start-up in the T1 game that has been growing rapidly and already captured an estimated 6% of the market. It has been mentioned as the most likely IBM take-over candidate. But the company is a very independent, well-financed entity, with at least $24 million in venture capital and about $50 million from its initial public offering in January. The stock has all the earmarks of becoming another darling of institutional investors, who may run up its price and prevent a takeover at a price acceptable to potential acquisitors.

As a result, IBM's acquisition appetite is now believed to have shifted to Timeplex, Inc., a well-established multiplexer vendor and leader in T1 network equipment with an estimated 30% market share. With annual sales of more than $100 million, Timeplex has the resources and know-how to build the sophisticated high-end T1 equipment that could fill gaps in IBM's existing data communications product lines.

Whether the current excitement in the T1 equipment marketplace will result in an IBM takeover is, of course, highly speculative. It is more likely that IBM may choose one of the vendors as an OEM supplier of its T1 products.

Whatever happens, one thing remains certain. An IBM-selected company and its stockholders cannot go far wrong and will undoubtedly benefit greatly from such an association.

Stuprowicz is president of 21st Century Research in North Bergen, N.J.

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President
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Ellen Freeman is president of Freeman Associates, a media planning and buying service for high-tech advertisers. With 11 years of agency experience, Ellen is one of a handful of people who understands how to plan media for high-tech companies. She has been involved with international as well as domestic programs, and she has definite opinions about the services of CW Communications.

Ellen explains, ***"High-tech companies generally don't have the information they need to evaluate international markets. But CW International Marketing Services makes it easy to explore foreign markets by offering in-depth marketing knowledge and expertise."***

Ellen recognizes the frustration of media buyers when considering foreign media. She says, ***"There are so many factors involved — time and language differences, commission structures, exchange rates, taxes, translation, mechanical specs. Billing alone is a nightmare."*** **She adds,** ***"But CW offers the single-vendor solution. One phone call to a local rep, and I can place my clients' advertising in virtually any computer market in the world."***

She continues, ***"There is a definite lack of research available on foreign publications in comparison to the volume of circulation and readership information provided by U.S publications."*** **However, Ellen trusts CW International Marketing Services to help her make media choices. She explains,** ***"CW brings more information to the table than any company I've dealt with. No one else makes international buying as easy."***

Ellen sums it up, ***"There are too many things U.S. media buyers take for granted. Buyers generally don't even know the right questions to ask when dealing abroad. CW helps us plan and buy media in multiple countries — all in one 'American' package, eliminating costly errors."***

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Ashton-Tate

CONTINUED FROM PAGE 113

additional technology.

Analyst Charlotte Walker of L. F. Rothschild, Unterberg Towbin in New York said she believes Ashton-Tate is trying to downplay the importance of its acquisition plans. "They were hotly after acquisitions in the 1986 period. They'll de-emphasize it this year, but they'll make the acquisitions anyway," she predicted.

In its financial performance, Walker said Ashton-Tate's results were good, but, she said, they were "actually shy of my expectations." She said the company's cost of sales was down significantly, to 13% or 14% from 16% in fiscal 1986. "That easily gave them $1 million or more in profits," she said.

Ruthann Quindlen, an analyst with Baltimore-based Alex Brown & Sons, Inc., said the results were "better than our estimates. Revenue was slightly lower, but earnings per share were slightly higher."

Manufacturing improvements have reduced Ashton-Tate's cost of sales and increased the strength of its international sales, Walker said. Ashton-Tate's international sales traditionally account for 25% or more of the company's business, Quindlen said. U.S. sales for the company will grow, based on the underlying unit hardware growth of 10% to 20%, she predicted.

But the rosy picture could get dim, the analysts said.

"We expect in about a year there will be increased competition from Microsoft Corp. and Lotus Development Corp. and minicomputer data base manufacturers, such as Oracle Corp. and Informix," Quindlen said.

Ashton-Tate will face increasing competition in the competitive environment, Walker said, particularly in the data base world. She said the competition would come from public and private companies.

Sales for its 1987 fiscal year, ended Jan. 31, were $210.8 million, a 73% increase over sales of $121.6 million reported last year. Earnings for the annual period were $30.1 million, an increase of 81% over income of $16.6 million reported in fiscal 1986.

"Within 10 days we had the names of the best distributors in three foreign countries."

For nearly two decades, Land Grant has been involved with high tech in a variety of capacities. He is president of Land Grant & Company — a business devoted to export consulting and profitable concepts in global trade for high technology producers.

Land realizes the importance of networking in international business. And, he's been using CW International Marketing Services to help him expand his list of distributor contacts. *"CW's worldwide offices are nodes on a network — in touch with current trends as well as the customers and international middlemen U.S. manufacturers are seeking,"* he explains.

Land discusses how CW International Marketing Services helped his client, Phoenix Technology: *"Locating qualified candidates was one of our first steps in helping Phoenix select the right distributors. Within 10 days, we had the names of the best distributors in The United Kingdom, West Germany and France."*

CW International Marketing Services is the only source, aside from the Commerce Department, that provides comprehensive distributor information broken down by country and product line. *"For years, we had to gather and cross-reference distributor information from a hodge-podge of government and international trade sources. Now, CW provides us with a better source of fast, top-drawer information,"* says Land.

In fact, selected international market information is so scarce, Land is currently writing a guide entitled the *High-Tech Exporter's Sourcebook*. And he plans to continue relying on CW International Marketing Services for distributor contacts. He explains, *"The real added value of CW is its people and expertise in-place around the world."* He adds, *"Because CW Communications is a network of international offices, CW International Marketing Services has worldwide contacts and marketing information unavailable elsewhere."*

To find out how CW International Marketing Services can work for you, call Frank Cutitta, Managing Director, at 800-343-6474 (in MA, 617-879-0700).

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President
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CAD/CAM

CONTINUED FROM PAGE 113

available separately could cut off other market opportunities.

"Clearly, it's widely perceived that Computervision's strength is the depth and range of its software," says Bruce Jenkins, an analyst with Daratech, Inc., a CAD/CAM market research firm in Cambridge, Mass. "The expansion of that software is what will be crucial to its success."

According to Bart Salmon, Computervision users are less concerned with this issue than they were a year ago. When Caddstation was first announced, Salmon says there was more talk about it. "Now users understand the benefit of paying attention to the whole system. There is still some talk, but it's very small," Salmon adds.

Computervision plans to continue to beef up the Cadds 4X functionality and says that is the primary focus in research and development. "It's highly unlikely that a company like Computervision is going to be successful in developing CAD/CAM solutions as well as developing new computers," says Dick Paulson, the firm's vice-president of research and development. "We don't feel that we are doing our customers any service to invest our R&D money in the computer race."

Intergraph opinion differs

Apparently, Intergraph does not hold the same opinion. Having introduced the Interpro 32C last year, the Huntsville, Ala.-based company says it now plans to extend that to a full product line.

The workstation developed at Intergraph is based on the Fairchild Semiconductor Corp. Clipper chip, a microprocessor that reportedly processes five million instructions per second.

With this hardware, Intergraph announced plans last month to move into the stand-alone workstation market — a high-risk venture, some analysts say.

"On the surface, this makes very little sense," says Prudential-Bache's Conigliaro. "I'd like to think they're not talking about competing with Apollo Computer, Inc. and Sun. I'd like to think it'll be more of a niche approach."

Intergraph executives say they hope to see the system accepted as a general-purpose workstation and plan to pursue OEMs.

"What Intergraph is attempting to do is test the company to see how it would fare as a general-purpose vendor," says Daratech's Jenkins. "They're rolling high and it's a very daring move, but one of the few that we can imagine them doing," he adds.

Unlike Computervision, Intergraph had oo major setbacks in the 1980s, a fact that will certainly cushion its risky strategy. It managed steady growth selling systems based on Digital Equipment Corp. hardware.

However, Intergraph's success as one of DEC's largest OEMs has been challenged within the last year as DEC changed its approach to its OEMs.

"It's not as easy for us as it was before in terms of dealing with DEC, simply because their corporate direction has changed," says Allan Wilson, an Intergraph vice-president. Wilson cites cuts in discounts provided to OEMs as well as DEC's proprietary stance with its BI bus as two examples.

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EMPLOYMENT TODAY

Bank automation creating DP jobs

BY DENA ALLMAN
SPECIAL TO CW

Banks are facing increased competition from nonbanking companies that offer financial services and from other banks that are merging or consolidating to become regional entities. In response to these changes, many institutions are striving to create computer systems that offer additional services to their customers.

This change in the nature of banking has led to the widespread use of networking operations, such as automated teller machines, and the installation of microcomputers in nearly every department.

These trends add up to new opportunities for data processing professionals in the banking industry. Currently, there is a high demand for systems analysts, systems software programmers, telecommunications specialists and MIS managers, according to banking personnel recruiters.

But there is a catch. Despite their drive toward automation, most banks still prefer to hire DP professionals with banking experience. In some cases, they will even hire non-DP people who have banking backgrounds rather than experienced professionals, according to Andrew Guercio, vice-president of human resources at Northwest National Bank of Chicago.

Banks often hire recent college graduates because they are committed to the company for the long haul, says Tom Pitts of Robert Half International, Inc., a DP and financial services placement firm in New York. Because of their lack of experience, the graduates are willing to learn the bank's policies, and they can easily be moved from one department to another, he explains.

Established DP professionals with no financial experience are less attractive to a bank, Pitts adds. They are more difficult to train because they have been exposed to nonbanking environments for a long period of time, he says.

"DP people tend to identify themselves as data processing professionals and not as bankers. This ends up being a limitation for them in the banking industry," says Kit Needham, center manager of the American Bankers Association (ABA) in Washington, D.C.

To help DP professionals in other industries learn about banking, the ABA annually conducts a week-long course consisting of lectures that offer an overview of the industry and detail the daily decisions banking executives must make. This year, the course will be held twice: from July 26 to August 1 and from August 2 to August 8. Both sessions will be at the University of Colorado in Boulder.

Weighed against a bank's bias toward employees with financial backgrounds is the need for experienced professionals in the programming and telecommunications areas.

"We are seeing more of an emphasis in networking and microcomputer skills," says Lou Galterio, vice-president for corporate information and communications systems at Bankers Trust Co. in New York.

Organizational changes caused by bank consolidations have created a demand for professionals experienced with more sophisticated systems than those required by a single, smaller bank. "Banks are striving to implement these new systems in order for the mergers to be more successful," says Siobhan Mulroy, a market research analyst for Dunhill Personnel Systems, Inc. in Carle Place, N.Y.

Although professionals with specific skills, such as programming, are in demand, banks are also looking for people who can creatively develop new systems and applications that adapt to the changing needs of the bank and its customers, says Frank Kelly, managing director of human resources at Bank Administration Institute in Rolling Meadows, Ill.

Mergers and acquisitions in the southeastern part of the country are making that region a high-growth area for banking opportunities. DP personnel are needed to help financial institutions there deal with the increasing number of mergers and acquisitions.

The southwestern region is also identified as a growth area, particularly Texas and Oklahoma.

Salaries for DPers in banking are comparable to those of information systems employees in other industries. Recent college graduates can expect to start at between $20,000 and $25,000.

A recent survey by Robert Half International indicates that salaries for DP professionals in banking increased an average of 5% from last year. The highest rate of change was among positions in large banks, where operations managers' salaries rose from between $30,000 and $40,000 to between $33,000 and $43,000, nearly a 9% increase. By contrast, salaries for operations managers in smaller banks rose only about 3%, from between $30,000 and $39,000 to between $31,000 and $40,000.

Systems programmers' salaries rose more than 6% in large banks and almost 6% in smaller ones, with salaries ranging from $30,000 to $43,000. Programmers in general saw an increase of more than 8% in smaller banks and 6% in large ones, with salaries ranging from $22,000 to $30,000.

The survey is based on job listings submitted by employers to the recruitment company's offices nationwide.

Although banks pay competitively, they demand more from their employees, Galterio says. DP professionals in banking have to make an extra effort to make their systems reliable and accurate, he adds, because a large number of people and organizations depend on them.

Allman is a free-lance writer based in Chicago

Bank DP

Percentage of U.S. DP personnel employed in the industry

Programmer/Analysts	29%
Programmers	23%
System Programmers	13.5%
Systems Analysts	8.5%
Electronic Data Processing Auditors	6.8%
Systems Developers	3.2%
Electronic Data Processing Analysts	2.9%
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Systems Managers	1%
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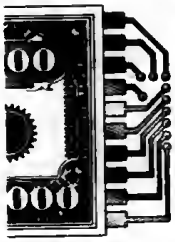

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CINCINNATI: Tom Group, 7875 Reading Road, Cincinnati, OH 45237 (513) 821-8275
CLEVELAND: Innovative Resources, Inc, Statler Office Tower, Suite 426, East 12th & Euclid, Cleveland, OH 44115 (216) 621-4220
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DALLAS: DataPro Personnel Consultants, Inc, 12770 Hillcrest, Suite 520, Dallas, TX 75230 (214) 661-8600
DENVER: Abacus Consultants, Inc, 1777 South Harrison Street, Suite 404, Denver, CO 80210 (303) 759-5064
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MIAMI: Data Solutions Personnel, Inc, P.O. Box 8677, Hollywood, FL 33024 (305) 434-8112
MILWAUKEE: EDP Consultants, Inc, Chancellory Park II, Suite 250, 300 N. Sunnyslope Road, Brookfield, WI 53005 (414) 797-4850
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Sutter Health System

EOE M/F/H

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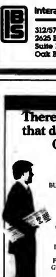

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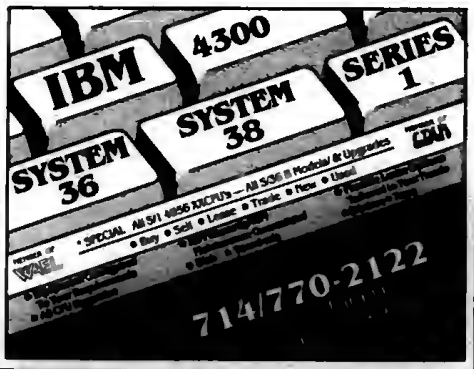

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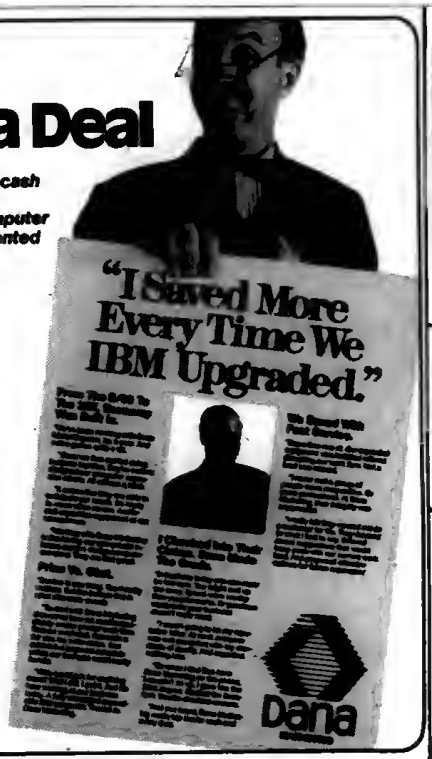

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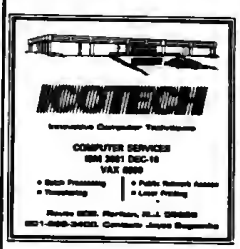

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The house

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designed specifically around the new 90,000-square-foot data center.

The nine-story, 732,000-square-foot building is simply an MIS manager's fantasy fulfilled. According to Mel Sotnick, principal designer on the project, Shearson was unusual in that it opted for form and function above any other consideration.

"Most people worry about how a building is going to look. Jack Owens was only concerned about how it functioned as a data center. He was willing to give up, for example, all corner offices with a river view so that we could handle the difficult cabling and channeling questions that arose," says Sotnick, senior managing principal designer for Kling Lindquist, the Philadelphia design engineering firm that worked with Shearson.

The building, which houses Shearson's three IBM 3090 Model 400s, a 3090 Model 200, a 3084 and a Unisys Corp. A10, operates 24 hours a day, seven days a week. It is virtually self-sufficient. Not only do features include a state-of-the-art dual uninterruptible power supply, but the building can provide its own water supply from a 150,000-gallon tank in the basement. Each of the four data center floors provides 50,000 square feet (offering a potential 200,000 square feet of data center space) connected to 22,000 square feet of front-office space — enough room to hold an entire football field with end zones and sidelines.

In addition, the level of redundancy in virtually every aspect of the building, from pipes to buss ducts (electrical conduits) to chilled water risers, is, according to Sotnick, unsurpassed in any data center in the country.

"I'm 99.9% sure that the electrical and mechanical systems can't go down," adds Dennis Cronin, Shearson's vice-president of facilities engineering. "Of course, the only sure things in life are death and taxes, but we thoroughly tested out this building with a full-design stress test to prove out the systems beforehand. That is not ordinarily done, but we wanted to know what the system could do."

The building, purring like a new engine for four months now, was designed to provide nonstop operation, and failure of no single building component can shut it down. "The building was designed so that we can complete any mechanical or electrical testing or maintenance without any effect on the end user," Cronin says. During the design phase, Owens says, he constantly asked what elements could shut a system down, and every potential snag was outfitted with a sophisticated backup.

Owens says he also carefully studied the geometry of the plan before building. Starting with the premise that he wanted uninterrupted 50,000-square-foot spaces, he designed an offset core that left a huge rear section of the building for the data center and 22,000 square feet of front-office space. Ceilings range from 16 to 24 feet high, and all cable chases and electrical closets are set in the corners — an unused space in data centers — rather than in prime computer locations.

All floors in the office space are raised so that cabling for networking systems can be easily installed, repaired and upgraded, and a dual-redundant fiber-optic connection was placed throughout the building.

The road to state of the art, however, was a long one. In the early 1980s, Shearson realized a new center was imperative. The planning process was spurred by MIS and supported by senior management.

"It wasn't a hard sell to management at all," Owens says. "For years, management has realized that MIS is not an adjunct to what we do but is really the vehicle through which we do our business. Without MIS, we can't operate or do business. The chairman, Peter Cohen, was an active participant and one of the driving forces in the negotiations for the building."

Although Shearson merged with American Express Co. during the early planning process, the new data center was strictly a Shearson project. The firm continued to grow through mergers and acquisitions during the planning. "Every time we thought we had the needs and requirements set, we'd turn around and find we were dealing with something 40% or 50% bigger," Owens says.

Although this constant starting, stopping and restarting was a hindrance, it afforded Owens' MIS team and the company's facilities management staff further opportunity to study the options. They began to realize what they did *not* want.

At the outset, in fact, there had been no intention of building a stand-alone data center. Like everyone else constricted by a downtown setting, Shearson was seeking a new data center within an office complex. "We asked three questions," Owens recalls. "First, How much money would we have to invest to create the environment we thought we needed? Second, How close could we come to that environment starting out in an existing structure that already had inherent limitations? And third, When we got done, how close would we be to the ideal of what we wanted?"

Several extensive engineering studies persuaded Owens that trying to fit into an existing or new office structure would cost "sizable" dollars and that there were some limitations that simply could not be overcome. The research also indicated the ideal data center would look more like an industrial warehouse than an office building — another stumbling block.

"We had a lot of professionals, both on the support staff as well as the development staff, who we wanted to keep close to the data center," Owens explains. "We decided that due to the way we operate — with the reaction time and availability requirements we need — having the programmers in close association with the operational people was a benefit we wanted to keep."

The final requirements were clear: quality office space for professionals and a highly available, reliable and secure data center. The only solution: a building designed from scratch.

City block in Manhattan

Working in conjunction with both the city and New York state, Shearson acquired a sizable parcel of land — the equivalent, Owens says, of more than a city block in lower Manhattan.

Set amid rows of gloomy warehouses and loading docks in what is known as the Tribeca section (the triangle below Canal St.), the Shearson building shines like a new penny in a stack of old change.

The data center was conceived and constructed in relatively short order. After a 14-month period of negotiation, rezoning and bargaining for the land, the building was finished in 23 months.

During the land negotiations and the building process, Owens and his design team members immersed themselves in the exercise of planning a perfect solution. Bringing together DP needs and skills within construction constraints was a step into uncharted territory for Owens' team. Component failure impact analysis, used extensively in designing hardware systems, is not generally considered in building design, but it was in this case. "A lot of the disciplines that DP uses every day in high-availability systems are not thought processes that construction people generally use," Owens says. "So we had to bring them together."

Cost justification was simple: Without this facility, Shearson could not grow and compete. The securities business was evolving into a 24-hour, seven-day-a-week on-line operating environment; there was no room for system failure. In fact, there was not even room to bring down the facility for a weekend of maintenance or repair work. "This is a major issue data centers are facing today," Owens declares. "The idea of a nonstop operation was not widely designed into operating facilities."

Asking again and again which systems could shut down the operation, Owens drew cutoff lines. Any financial cut to a component that could shut the operation down for more than eight hours, for example, was immediately eliminated.

"People would say, 'You don't do these things. Nobody does these things,' " Owens relates. "And I said, 'Why not? Can you prove to me it will never fail?' "

That attitude, while proactive, is costly. In order to cut the costs of the extensive redundancy, Owens focused on shrinking the footage necessary to hook systems together. "The cost is in the footage," he explains. "We looked at the geometry of the cooling system, chillers, data center emergency generators and the electrical switch gear and said, 'Hey, if we can package all this stuff together to minimize distances between them, we can achieve the results we are looking for while minimizing the cost.' "

Shearson upgraded to 3090s when the move occurred, and that decision has already paid dividends. On a recent record day on Wall Street, the system monitored and handled the load without any noticeable degradation of performance.

Nonetheless, Owens is modest about his project. "I don't think it's absolutely unique. I'm sure there are eight or 10 data centers with similar capabilities in the country. We might have pushed the methodology and level of redundancy a bit further, but I don't think we've redefined the state of the art," he says.

Kling Lindquist's Sotnick, whose firm is a leading designer of data centers, disagrees. "I'd have no hesitation taking a client there to show them what is now the state of the art."

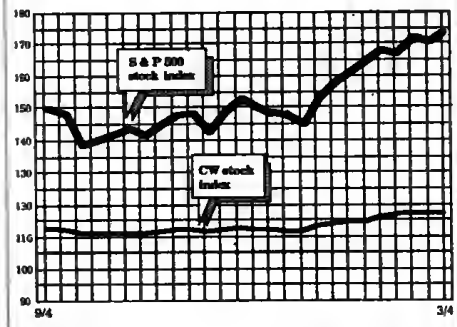
Owens is also pragmatic. "We knew that today's state of the art would not be state of the art over the lifetime of the building," he says. "So we built in the ability to grow and add to the base mechanical systems in the building, to expand the data center and to build flexibility into the communications systems."

Shearson's new data center *building adorns its Manhattan neighborhood.*

CW PHOTO BY GLENN KIPKEN

More than 2,100 *backup batteries provide emergency power.*

STOCK TRADING INDEX



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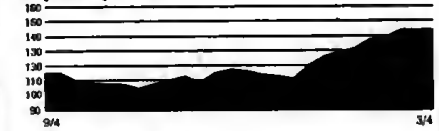
Supplies & Accessories	163.0	162.0
Software & DP Services	131.5	131.5
Semiconductors	106.2	110.0
Peripherals & Subsystems	127.8	129.8
Leasing Companies	119.0	122.2
Composite Index	117.1	117.3
S&P 500 Index	169.8	172.6

Computer Systems



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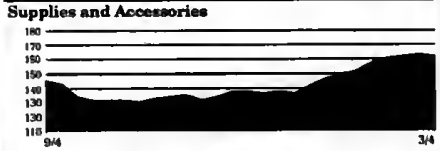

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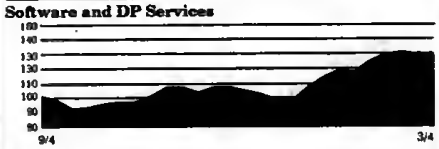

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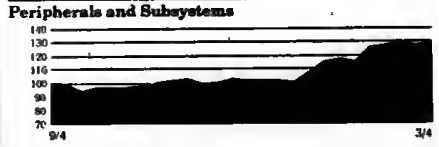

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Stock trading summary

CLOSING PRICES WEDNESDAY MARCH 4 1987

Exch		52 WEEK RANGE (1)		PRICE CLOSE MARCH 4 1987	WEEK NET CHNGE	WEEK PCT CHNGE
	Computer Systems					
O	ALPHA MICROSYSTEMS	6	4	4 88	-0 1	-2 6
O	ALTOS COMPUTER SYS	19	10	16 13	-0 6	3 7
A	AMDAHL CORP	40	14	37 63	1 1	2 9
O	APOLLO COMPUTER INC	23	9	19 38	1 5	7 2
N	APPLE COMPUTER INC	71	24	87 63	1 5	2 2
N	AT&T	25	22	23 13	-0 1	-0 5
O	C P 1 CORP	8	3	4 25	-0 6	12 6
N	COMPAQ COMPUTER CORP	35	12	31 25	-0 6	2 7
A	COMPUTER CONSOLES INC	12	6	9 38	-0 4	3 6
O	CONCURRENT COMP CORP	23	11	15 38	-0 6	-6 0
N	CONTROL DATA CORP	31	20	26 25	1 5	5 0
O	CONVERGENT TECH	12	4	10 88	+0 6	+7 4
N	CRAY RESH INC	122	65	120 25	+2 4	+2 0
O	DAISY SYS CORP	15	6	11 50	-0 1	1 1
N	DATA GEN CORP	45	25	36 50	-1 1	-3 2
N	DATAPOINT CORP	9	4	5 13	-0 4	-6 6
N	DIGITAL EQUIP CORP	167	76	166 25	+11 3	+7 3
N	FLOATING POINT SYS INC	46	11	15 38	-0 0	+0 0
N	GOULD INC	25	15	19 13	-0 1	0 6
N	HARRIS CORP	40	27	37 88	+0 5	+1 3
N	HEWLETT PACKARD CO	60	38	55 25	+1 1	+2 1
N	HONEYWELL INC	84	58	69 50	-0 9	+1 3
N	IBM	162	116	139 88	1 9	1 3
O	IPL SYS INC	4	2	2 50	-0 3	-9 1
N	ITT CORP	65	63	65 00	+2 9	+4 6
N	M A COM INC	19	12	14 63	-0 0	-0 0
N	MATSUSHITA ELEC INDL LTD	136	89	116 50	3 8	3 1
O	MENTOR GRAPHICS CORP	25	11	27 13	0 8	2 7
N	NBI INC	14	6	10 63	+0 5	+4 6
N	NCR CORP	68	40	68 75	+1 3	+1 9
N	PRIME COMPUTER INC	26	16	21 75	+0 0	-0 0
O	STRATUS COMPUTER	34	17	32 00	0 6	2 3
O	SYMBOLICS INC	15	4	3 94	0 2	4 5
O	TANDEM COMPUTERS INC	68	22	65 13	+5 4	+6 0
N	TANDY CORP	55	31	53 38	+0 8	+1 2
N	TEXAS INSTRS INC	188	103	168 75	+8 4	+5 3
A	ULTIMATE CORP	35	13	24 00	+1 4	+6 1
N	UNISYS CORP	113	58	104 38	-4 0	3 7
A	WANG LABS INC B	22	11	15 50	+0 5	-3 3
A	WANG LABS INC C	22	11	15 75	+1 0	+6 8
N	XEROX CORP	75	49	73 00	-0 6	1 0
	Supplies & Accessories					
N	AMER BUSINESS PRODS	37	23	30 00	1 0	3 2
N	BARRY WRIGHT CORP	25	14	17 75	1 3	6 6
A	DUPLEX PRODS INC	23	16	22 00	+1 0	-4 8
N	EWNS BUSINESS FORMS INC	34	22	31 50	0 4	1 2
N	3M CO	140	95	126 88	0 6	0 5
N	MOORE LTD	28	20	23 50	-0 4	1 6
O	STANDARD REGISTER CO	53	32	49 75	+1 5	-3 1
N	WALLACE COMPUTER SVCS	50	37	47 25	+0 0	-0 0
	Software & DP Services					
O	ADVANCED COMP TECH	7	3	4 25	-0 3	-6 3
N	ADVANCED SYS INC	21	12	19 63	-0 3	-1 3
N	AGS COMPUTERS INC	38	17	37 75	+1 6	-4 9
O	AMERICAN MGMT SYS INC	31	13	26 75	0 5	1 7
O	AMERICAN SOFTWARE INC	27	9	25 00	+2 3	+6 9
N	ANACOMP INC	7	3	7 13	-0 9	-14 0
O	ANALYSTS INTL CORP	11	4	10 25	+0 0	-0 0
O	ASHTON TATE	30	10	26 38	0 1	-0 5
O	ASK COMPUTER SYS INC	17	9	16 00	0 3	1 5
O	ASTRADYNE COMP IND	3	1	1 78	-0 1	3 4
N	AUTOMATIC DATA PROC	47	29	43 25	1 6	3 6
O	BOOLE & BABBAGE INC	11	4	10 00	+1 0	+11 1
N	COMPUTER ASSOC INTL INC	44	17	40 25	+0 6	+1 8
O	COMPUTER HORIZONS CORP	15	10	13 50	0 3	1 6
O	COMPUTER NETWORK TECH	10	4	4 44	0 3	6 6
N	COMPUTER SCIENCES CORP	54	30	52 50	+2 8	+5 5
O	COMPUTER TASK GROUP INC	19	11	15 63	+0 0	-0 0
O	COMPUTONE SYS INC	6	0	0 19	+0 0	+0 0
O	COMSHARE INC	16	10	14 25	-1 3	+6 6
N	CULLINET SOFTWARE INC	16	9	10 25	-0 1	1 2
O	CYCARE SYS INC	17	7	9 13	-0 1	1 4
O	DUQUESNE SYS INC	25	9	24 25	23 3	48 9
N	GENERAL ELEC CO	106	71	105 75	+3 0	+2 9
N	GENERAL MTRS CORP	50	24	38 13	-1 8	+5 0
O	HOGAN SYS INC	15	7	12 63	-0 3	1 9
O	INFORMATION SCIENCES INC	4	1	1 50	+0 3	+20 0
O	INFOTRON SYS CORP	16	7	6 50	1 0	10 5
O	KANE INC	16	5	8 63	-0 4	-4 2
N	LOGICON INC	38	22	25 13	-0 1	-0 5
O	LOTUS DEV CORP	25	6	22 13	1 4	5 9
O	MANAGEMENT SCI AMER	21	11	16 25	0 9	4 3
O	MCI COMM CORP	13	5	5 88	+0 9	-9 3
O	MICOM SYS INC	19	10	14 75	+0 0	+0 0
O	MICRO PRO INTL CORP	6	2	4 94	-0 1	+1 3
O	MICROSOFT CORP	80	26	79 75	-5 3	-7 0
O	NATIONAL DATA CORP	27	16	24 25	0 6	2 5
O	ON LINE SOFTWARE INT	23	10	21 25	-0 4	1 7
O	ORACLE SYS CORP	42	13	41 50	-9 6	+16 6
N	PANSOPHIC SYS INC	42	25	38 63	+0 8	-1 8
O	PERLEY MGMT SYS CORP	30	15	28 00	1 0	3 4
O	PROGRAMMING & SYS INC	13	6	11 75	-0 5	4 1
O	REYNOLDS & REYNOLDS CO	42	27	35 75	-0 3	0 7
O	SCIENTIFIC COMPUTERS INC	6	4	7 75	+0 0	-0 0
O	SCI CORP	27	15	24 75	-1 0	-4 2
O	SHARED MED SYS CORP	53	30	34 38	-3 0	-8 0
O	SOFTWARE AG SYSTEMS INC	22	10	15 50	2 4	13 3
O	SOFTWARE PUBG CORP	16	5	14 25	0 4	2 6
O	STERLING SOFTWARE INC	21	10	13 50	-0 1	-0 9
N	SUNGUARD DATA SYSTEMS	20	10	19 75	+0 3	-1 3
N	UCCEL CORP	34	17	33 00	1 3	3 6
N	URS CORP	22	13	20 88	-0 3	1 2
O	VM SOFTWARE INC	38	12	36 00	-0 3	-0 7
	Semiconductors					
N	ADVANCED MICRO DEV	34	13	27 25	-0 3	1 2
N	ANALOG DEVICES INC	25	14	20 63	+0 1	+0 6
O	ANALOGIC CORP	14	10	11 88	+0 5	+4 4
N	APPLIED MAGNETICS CORP	29	13	28 00	-4 6	-19 6
O	AVANTEK INC	23	14	16 63	+0 9	-4 9
O	BMC CORP	9	3	5 25	+0 4	-7 7
O	INTEL CORP	38	16	38 50	1 3	3 3
O	MICRO MASK INC	7	2	6 00	-0 3	-4 3
N	MOTOROLA INC	51	34	48 50	0 5	1 0
N	NATIONAL SEMICONDUCTOR	16	6	15 75	+0 0	+0 0
N	TERADYNE INC	30	16	23 38	-0 6	-2 7

Exch		52 WEEK RANGE (1)		PRICE CLOSE MARCH 4 1987	WEEK NET CHNGE	WEEK PCT CHNGE
	Peripherals & Subsystems					
A	AM INTL INC	6	6	6 63	0 4	4 2
A	ANDERSON JACOBSON INC	3	1	3 00	+0 9	+41 2
O	AST RESH INC	25	11	21 75	+3 5	+19 2
O	AUTOTROL CORP	10	5	7 50	1 0	11 8
O	AVANT GARDE COMPUTING	7	3	4 00	+0 0	-0 0
O	BANCTEC INC	13	6	10 75	0 9	9 5
N	BOLT BERANEK & NEWMAN	60	37	54 75	-1 0	-1 9
A	CETEC CORP	9	6	6 13	+0 3	-4 2
A	COGNITRONICS CORP	8	2	3 00	-0 0	-0 0
N	COMPUGRAPHIC CORP	27	16	22 00	0 3	1 1
N	COMPUTERVISION CORP	23	10	20 88	0 1	0 6
N	CONRAC CORP	16	12	18 00	+0 5	-2 9
A	DATAPRODUCTS CORP	16	11	14 00	0 1	0 6
A	DATARAM CORP	18	7	7 63	-0 4	-5 2
O	DATA SWITCH CORP	9	5	7 00	+0 3	-3 7
O	DATUM INC	7	4	6 00	0 3	4 0
N	DECISION INDS CORP	15	8	10 88	0 6	5 4
O	ENDATA INC	9	5	8 63	0 1	1 4
O	EMC CORP	34	11	27 25	1 5	9 2
O	EVANS & SUTHERLAND	38	20	37 50	-3 9	+10 3
N	FLOATING POINT SYS INC	46	11	15 38	-0 0	+0 0
O	GANDALF TECHNOLOGIES	9	5	6 50	0 1	1 4
O	GENERAL DATACOMM IND	15	6	12 88	-1 9	-17 0
N	HAZELTINE CORP	30	16	25 75	+0 0	-0 0
O	ICOT CORP	13	6	11 38	0 5	4 2
O	INFORMATION INTL INC	16	13	14 50	+0 0	-0 0
O	INTECOM INC	7	3	3 00	+0 0	-0 0
O	INTERLEAF INC	15	6	9 50	1 1	10 6
O	MEGADATA CORP	7	2	5 25	0 9	14 3
A	MSI DATA CORP	15	10	14 00	0 3	1 6
N	NASHUA CORP	25	20	26 13	-1 8	-6 4
O	NETWORK SYS CORP	16	10	17 00	0 1	0 7
N	NORTH AMERN PHILIPS CORP	48	35	42 00	+0 3	-0 6
N	NORTHERN TELECOM LTD	45	27	42 38	+0 9	-1 2
O	NOVELL INC	43	14	42 25	-5 0	-13 4
N	PARADYNE CORP	11	4	6 75	+0 6	-14 6
A	PENRIL CORP	6	4	4 50	0 1	2 7
N	PLESSEY PLC	39	24	38 00	-2 0	+5 8
O	PRINTRONIX INC	15	10	11 38	0 1	1 1
O	QMS INC	16	11	10 13	+0 0	+0 0
O	RAMTEK CORP	7	3	5 00	-0 1	-2 6
N	RECOGNITION EQUIP INC	27	10	21 63	-1 6	-8 1
O	SCAN TRON CORP	16	11	11 50	+0 0	-0 0
N	SCIENTIFIC ATLANTA INC	16	9	15 38	+0 1	+0 6
O	SEAGATE TECHNOLOGY	42	6	36 63	0 5	1 3
N	STORAGE TECHNOLOGY	7	2	4 75	+0 5	-19 2
O	SUN MICROSYSTEM INC	32	11	28 25	0 4	1 3
A	T BAR INC	6	5	7 63	0 3	3 2
A	TAB PRODS CO	19	12	16 63	+0 6	-3 4
O	TANDON CORP	6	2	3 75	-0 3	-7 1
A	TEC INC	7	3	3 75	+0 0	+0 0
N	TEKTRONIX INC	43	27	39 13	0 6	1 6
O	TELEVIDEO SYS INC	4	2	2 38	0 3	6 9
N	TELEX CORP	102	53	92 00	4 9	5 0
N	TIMEPLEX INC	38	14	35 00	-0 1	-0 4
N	TITAN CORP	12	6	7 50	+0 0	+0 0
O	VISUAL TECHNOLOGY INC	1	0	0 44	+0 0	+0 0
O	WYSE TECH	29	13	26 25	-0 5	-1 6
	Leasing Companies					
N	COMDISCO INC	27	19	27 00	+1 4	+5 4
N	CONTINENTAL INFO SYS	14	7	13 13	+0 6	+7 1
O	FINALCO GROUP INC	5	2	2 88	-0 0	-0 0
O	PHOENIX AMERN INC	6	3	6 75	-0 0	-0 0
O	SELECTERM INC	12	5	5 75	-0 0	-0 0
N	U S LEASING	50	28	50 25	-1 6	-3 3

EXCH N = NEW YORK A = AMERICAN P = PACIFIC B = BOSTON
L = NATIONAL M = MIDWEST O = OVER THE COUNTER S = SPLIT

O T C PRICES ARE BID PRICES AS OF 3 P M OR LAST BID
(1) TO NEAREST DOLLAR

Mid-week rally roars

DEC, Apple bounce back; IBM, Cray, TI rise to occasion

A mid-week kicker boosted computer industry stocks, particularly those of Digital Equipment Corp., which introduced three mid-range systems and a dramatic price structure overhaul last week (see story page 1).

On Monday, when the Dow Jones Industrial Average dropped 3.52 points and the National Association of Securities Dealers Automated Quotations fell 1.06 points, Apple Computer, Inc. slipped 2½, despite the announcement of new Macintosh models.

Apple, which had reached a record high of 69⅛ the previous week, dropped another 2½ points to 65 last Tuesday before recovering on Wednesday and Thursday to 68½.

The overall recovery occurred on Wednesday and Thursday, when the Dow advanced by 49.9 points and DEC soared 9¼ points on Wednesday and 4½ points on Thursday.

Other gains were posted by IBM, up 1¾ on Wednesday, Cray Research, Inc., which was up 4 points on Wednesday and 3¾ points the next day, and Texas Instruments, Inc., which climbed 7⅛ points during the two-day surge.

JAMES CONNOLLY

Alpha aims macro at MIS users

Features include full-blown programming language

BY DOUGLAS BARNEY
CW STAFF

BURLINGTON, Mass. — Alpha Software Corp. next week plans to announce Keyworks Advanced Version, a $299 macro generator and programming language aimed squarely at MIS professionals. The product is set to ship sometime this month.

Unlike other random-access memory-resident macro generators that simply record and play back keystrokes, Keyworks Advanced Version has a full-blown programming language.

"The user can control other applications, read screens and decide what branch a macro should go down, depending on what the screen says," an Alpha source explained. "Let's say you have automated logging on to a mainframe to exchange data. The mainframe sends back a message, either the data was accepted or rejected. Keyworks could read rejected and, as a result, branch to a series of additional commands; or, if accepted, take another approach."

A beta-test user in a large corporation agreed. "When you are trying to communicate with a mainframe, the potential for problems is tremendous. It is very possible that you would get a message or you would have to hit the CLEAR to clear off the screen first," the user said.

Runtime copies of the advanced version will be available for $20 to $40, according to Larry Rafsky, president of Gari Software, Inc., a Roseland, N.J.-based independent consultant. "I would see MIS buying one copy of Advanced Version and many copies of the runtime," Rafsky said. With the runtime version, users reportedly can use macros created for them but cannot create elaborate macro systems. An Alpha official told *Computerworld* the runtime pricing has not been set.

'A step beyond'

The package and the runtime version have a broad range of applications. "It allows us to automate the execution of any program. It goes a step beyond plain keyboard macro programs by allowing you to read from the screen and issue different keystrokes to the program based on the results of what is on the screen," the beta-test user said.

Automating communications with a host computer is one key feature. "We make it so the person says, 'I want to take the file from Displaywrite and put it in a document on the mainframe.' They pick a pop-up menu of all the documents, arrow down to it, hit RETURN, and away it goes," the user said.

Rafsky has already used Keyworks Advanced Version to automate a communications system. "The package is memory-resident underneath Lotus's 1-2-3 and stays resident while the user is in Lotus and controls the micro-to-mainframe link. Keyworks talks to the communications package, does the download, reformats the data," he said.

Keyworks will compete largely with the Automator/MI, a $2,000 product from Direct Technology Ltd. in Middlesex, England.

Paradyne

CONTINUED FROM PAGE 1

which it will pay $1.2 million in fines and related costs.

Government investigators had charged that Paradyne misled the Social Security Administration (SSA) at a key procurement test by secretly using a Digital Equipment Corp. PDP-11 processor instead of the Zilog, Inc. Z-8000 processor that Paradyne had proposed in its bid. Investigators also said Paradyne misled the agency by bidding a P8400 controller that was not an off-the-shelf item, contrary to the bid specifications.

Paradyne countered that the processors were functionally equivalent and denied that it misled the SSA about the availability of the P8400 controller.

According to the terms of the settlement, Paradyne's president and chief executive officer, Robert S. Wiggins, resigned when the settlement was announced Thursday. Wiggins, one of eight Paradyne officials named in the indictment, had offered his resignation as a bargaining chip in the settlement negotiations, a Paradyne spokesman said.

Named to replace Wiggins was Jerry T. Kendall, formerly Paradyne's vice-president and chief operating officer. Paul J. Ferri, a Paradyne board member for 14 years, was appointed chairman of the board.

Paradyne is now free to conduct business with the federal government. The data communications vendor was barred from bidding on government contracts in the wake of the December 1985 45-page indictments. The indictment alleged Paradyne and certain officials attempted in 1981 to defraud the U.S. government to secure a $115 million contract, the largest ever awarded by the SSA.

Most significantly, Paradyne can now refocus its attention on attempting a return to profitability after years of taxing, time-consuming legal concerns and disappointing sales. Since the Securities and Exchange Commission began investigating the SSA contract in 1983, Paradyne's legal costs in the matter have totaled $18 million, according to a company spokesman.

"It's the end of a long nightmare for Paradyne," said Andy Schopick, a senior analyst with the Gartner Group, Inc. in Stamford, Conn.

The inevitable question in the matter, according to Schopick, is why the company waited three years before settling out of court. "There were probably other opportunities to get out of this thing, and they've wasted a lot of time and money," he said. "One has to question the management decisions regarding this matter."

Rather than worrying Paradyne users about the company's guilt in the matter, the settlement should reassure them that the company is back on track, said Paul Bloom, an analyst with Johnson, Lane, Space, Smith & Co. in Atlanta. "Users should feel comfortable that the company can now focus on new products rather than having to deal with litigation," he added.

Under the settlement, Paradyne agreed to establish a "company government contract oversight committee" and a "government procurement ethics program," the company said.

In addition, Paradyne's contract with the SSA has been modified to allow the SSA to phase out Paradyne communications equipment in favor of IBM's 3270 network system. Paradyne equipment is to be phased out gradually beginning this May and ending in December 1988.

The value of the settlement was estimated at $8.125 million, $2.9 million of which is to be covered by Paradyne's insurance policy. Other settlement costs are covered by an $8 million provision the company set aside at the end of 1986.

Wiggins — a 13-year Paradyne veteran — and other officials are *not* required to admit to any wrongdoing. Charges against Wiggins and three other officials were deferred under a one-year pretrial diversion agreement and, if the agreement is successfully completed, will be dropped. Charges against four other officials were dropped.

The agreement "neither admits nor proves that the government was defrauded by the company or any individual," said Paradyne's senior vice-president and general counsel, James L. Slattery.

INSIDE LINES

Hurry up and wait. While some small software developers must wait another six months, sources report that a major bank in New York already has a beta-test version of Microsoft's semiannounced 286 DOS. The smaller developers, pleased that an official beta-test version of the operating system will ship within six months, would still like an early peek at the software. But that's something Microsoft, in most cases, is unwilling to give, developers report.

In that case . . . NEC Electronics was rebuffed in its bid to disqualify Judge William Ingram in its lawsuit against Intel. NEC sought the disqualification when it learned in October that Ingram owned interest in Intel stock through an investment club while presiding over proceedings in the lawsuit. In the suit, which is still pending, NEC is seeking a judgment that micro code is not copyrightable subject matter and that the control function in some NEC V-series microprocessors does not infringe on any valid Intel copyrights.

Lighting the information path. The technology is still very much in the laboratory, but optical computing took another step forward last week when IBM scientists said they have developed an experimental high-speed chip designed to transform light into electrical signals. IBM claimed its chip is fast enough to read 40 encyclopedia volumes every second. The chip isn't a pure optical product but rather a hybrid gallium arsenide chip that incorporates dissimilar communications and computing circuits.

Show me. At Interface '87 later this month, Spectrum Concepts will announce what it claims is the first commercial LU6.2-based data transfer application. The fruit of some three years' programming efforts, XCom 6.2 will eventually support LU6.2-based peer-to-peer data transfer among a wide range of minicomputers, mainframes and microcomputers, the vendor says. If it delivers on this promise, XCom 6.2 will confound industry pessimists who have claimed that we wouldn't see commercial LU6.2-based applications until the 1989-to-1990 time frame.

Buyer Beware. A report is circulating that Unisys, the Sperry-Burroughs hybrid, is considering dropping the Unisys 5090, a Unix multiuser system for which Sperry acts as OEM for Arete Systems in San Jose, Calif. The concern, apparently, is that the 5090 overlaps somewhat with the Burroughs XE550, now the Unisys 5070. A Unisys spokesman said no such plan was in the works. However, he would not rule out the possibility that some products might be discontinued in the future because of technological advances.

Netting an elusive project. Look for 3Com shortly to announce a family of "net stations" and explain how those products fit into their strategy. Observers predict the line will include a diskless workstation and a workstation featuring a built-in network adapter card. Incidently, do you remember 3Com's Distributed File Server concept for a data base server and standard interface? Announced last summer, the project isn't dead, insists a 3Com executive; rather, it's "dormant." Also involved in that project, according to sources, is data base vendor Ashton-Tate.

The German connection. New Jersey Bell, a Bell Atlantic telephone company, and Bell Communications Research, the research and development corporation that belongs to the seven holding companies, will conduct an Integrated Services Digital Network (ISDN) trial this fall. The system will use a Siemens EWSD digital switching system interworked with AT&T's 1AESS analog switch, multivendor customer premise equipment and experimental station equipment. If successful, this will allow customers to use existing networks for ISDN services.

An intelligent decision. Inference Corp., the expert systems firm that boasts over 500 installations of its artificial intelligence software, plans to port to the DEC VAX in a month or so. The package has previously been specific to AI workstations and Sun Microsystems hardware. Inference is also at work on a version of its products for the IBM 370 architecture.

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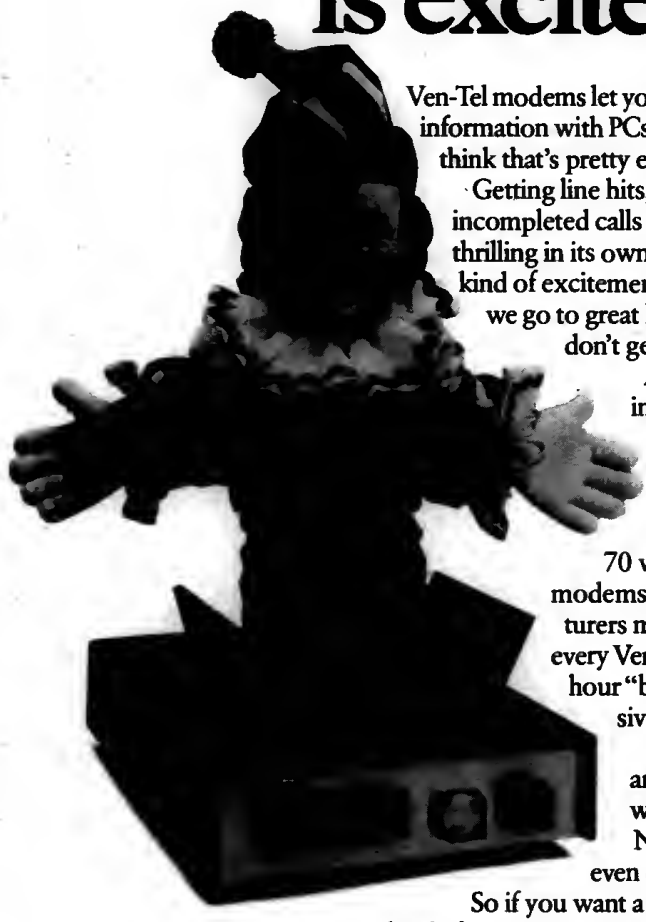
The last thing you want from your modem is excitement.



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